

*Feasibility Study
I-95 Corridor
Branford to Rhode Island*

November 2003

Transit Service Enhancements Analysis

Prepared for: Clough, Harbour & Associates LLP
2139 Silas Deane Highway
Suite 212
Rocky Hill, CT 06067

Prepared by: PARSONS
655 Winding Brook Drive
Glastonbury, CT 06033

1.0 INTRODUCTION

This report describes an analysis of potential transit service improvements in the I-95 corridor between Branford (Exit 54) and the Rhode Island state line. The analysis was intended to determine whether a set of in-state transit improvements could serve as a stand-alone alternative to adding capacity along I-95 to relieve summer Friday peak hour traffic congestion. The analysis was based upon the following:

- Application of the state's existing transportation demand estimation model as the basic tool for forecasting the year 2025 diversion of normal weekday travelers to transit. This application is consistent with the data developed for the remainder of the Feasibility Study.
- Application of a methodology developed to estimate additional potential diversion for summer Fridays, especially for visitors to Southeastern Connecticut. These leisure travelers are not explicitly represented in the state's weekday model.
- The analysis concentrated on the summer Friday peak hour travel period. This application is consistent with the focus of the remainder of the Feasibility Study.
- The modifications considered for transit would be limited to those that could be reasonably achievable within the State's resources and jurisdiction. In effect, this focused on transit services within the state of Connecticut, and excluded both reconstruction and significant modifications to Amtrak's Shore Line between New Haven and Rhode Island, and service or pricing strategies on interstate common carriers.
- The rail transit service enhancements which were analyzed were based upon the current Amtrak structure. Actual schedules that might be developed for these enhancements would be conditional on the agreement of Amtrak, and would be subject to railroad operating constraints, capacity, and marine traffic considerations.
- Consistent with the statewide forecasting framework, the estimates did not include significant changes in automobile availability or driving costs; over several decades, assumptions of this type have more often resulted in an underestimate of future auto use than an overestimate. The effects of future traffic congestion (based on year 2025 land use extrapolated from present trends) were included in the forecasts. The land use assumptions generally reflect a projection of free-market development trends within the context of existing zoning.

1.1 Report Structure and Contents

This report contains the following sections:

- Section 2 describes the set of transit enhancements that was examined. It defines the routes and schedules in terms of their changes from operations described in the study's draft *Existing Conditions Study* of April 2003.
- Section 3 describes the estimated year 2025 summer Friday peak hour diversion of highway traffic to the transit services.
- Section 4 describes the preliminary estimated capital costs, operating costs, and subsidy requirements of the suggested transit service enhancements.
- Section 5 is an assessment of the transit service enhancements as a candidate alternative for the Feasibility Study, including an environmental screening.
- Section 6 describes the methods used to estimate the diversion of travel to transit.

1.2 Executive Summary

The travel demand analysis in this report indicates that the transit service enhancements described in Section 2, without providing any additional capacity to I-95, could divert less than one percent of the summer Friday peak hour vehicle-miles traveled on I-95 (No Build) to a combination of existing and enhanced transit services. Although this represents roughly a doubling of transit use in eastern Connecticut, it corresponds to less than one year's traffic growth, and would provide only modest relief to the year 2025 levels of congestion expected to occur under No-Build conditions.

The cost analysis indicated an initial capital cost on the order of \$36 million to institute the enhanced services, and an annual increase in operating costs of \$3.0 million. Passenger fares would recover about 1/3 of these increased costs, resulting in an increase of about \$2 million (year-2002 dollars) in the State's annual transit subsidy levels. This would represent less than a two percent increase in the present statewide levels of support for transit.

When considered in terms of the Federal Transit Administration's year 2000 cost-effectiveness criteria for 'New Start' transit services, the enhancements would rate poorly. This suggests that a high level of Federal participation in funding the capital costs of the enhancements should not be taken for granted.

A preliminary environmental screening indicated no insurmountable obstacles to implementing the transit service enhancements as a candidate alternative. However, because the enhancements could not substantially achieve the project's goals and objectives in and of themselves, there appears to be no reason to develop them into a candidate alternative in their own right.

The results of this analysis should not be interpreted to mean that other benefits derived from these enhancements, or from other transit improvements in southeastern Connecticut would not warrant consideration of such improvements. Also, profound shifts in both land use development patterns and in factors affecting personal travel choices (auto availability and operating costs) could change the basic characteristics of travel by the year 2025. Assuming a continuation of general trends over the past several decades, however, there appears to be little likelihood that a set of transit enhancements that are within the state's means could avoid the need to make significant improvements to I-95 to relieve summer Friday congestion.

During the preparation of this Transit Service Enhancement Analysis, a draft of this report received a comprehensive review and comments from the study Advisory Committee. The Advisory Committee in general expressed their support for transit as a component of the transportation system in the region. This study recognizes the interest of the Advisory Committee that transit be considered both as a component of the multi-modal transportation system in the southeast corridor, and as a possible means of maintaining mobility through and within the corridor during construction activity.

Both within the corridor and in the regional and Statewide contexts, there is a clear and continuing commitment to multi-modal transportation alternatives. Amtrak's Northeast Corridor now offers both intercity *Acela Regional* and high-speed *Acela Express* passenger rail service along Connecticut's shoreline corridor, between Boston, Massachusetts and Washington, D.C. In both the I-95 and I-91 corridors the level of Amtrak intercity train service in Connecticut has recently been increased by over 30%, adding to the mobility of the region. Connecticut's Shore Line East commuter rail service (New London – New Haven – Stamford), local fixed route, Commuter Connection and paratransit bus systems, jobs access transportation, express bus operations, and rideshare opportunities represent a significant State transit funding investment and form a vital part of the regional transportation system.

State of Connecticut transit funding for the Shore Line East alone represents approximately \$6 million in operating subsidy per year, plus capital expenditures. Recent improvements of this type are primarily in stations and parking as well as service frequency improvements. In June 2001 the State opened a new \$7.4 million passenger station at State Street in New Haven. This station serves both Shore Line East and Metro North New Haven Line trains. Over 200 additional parking spaces were constructed at Old Saybrook, Madison, and Branford stations at a cost of \$600,000. And significantly, four new Shore Line East express trains through to Stamford were added in December 2001 and June 2002 which also improved the frequency of service to and from New Haven station, funded at an additional \$1.7 million in annual operating subsidy.

In the near term, more than \$30 million in further transit improvements are currently programmed or planned by the Department for implementation in the southeast corridor. These projects further include 500 new parking spaces for the Shore Line East commuter rail by 2006, as well as upgrading stations with high-level platforms. The replacement of bus equipment with new clean diesel technology buses is planned, and revisions in bus

routes (including express bus services) will continue as warranted to adapt the system to changing public needs.

For the longer term, the Transportation Strategy Board is now in the process of considering several new candidate transit projects for the I-95 east corridor that would build on the system in place. Purchase of added seats in the form of rolling stock for Shore Line East, and buses for the Norwich - New London area will be part of the regional strategy considerations that grew from the I-395 and Southeast Corridor Transportation Investment Areas.

The Transportation Strategy Board resources are funding the Southeastern Connecticut Council of Governments' (SCCOG) Intermodal Connections Study, which is one of two comprehensive transit studies now being conducted that will affect the southeastern corridor. This SCCOG evaluation of transit services will further seek to define the fundamental transit needs and opportunities for system revisions to guide regional and local transit development. The results of this study will be of significant importance to transit development and the community and regional planning process. This initiative is to be completed in the spring 2005.

The second study is the South Central Region Council of Governments' (SCRCOG) Regional Transit Development Strategies Study, which is expected to complement the SCCOG Study in the corridor. This initiative will be completed in late-2004 and will be used to develop a Regional Transit Implementation Plan that will present opportunities for improved coordinated transit strategies within the south central and across the southeastern region.

Both statewide and regionally, Connecticut's transit commitment is substantial, ongoing and development-focused. Transit performs an important role in the functioning of the transportation system as a whole. Managing the system to maximize efficiency and to meet regional and local needs will require both a continued focus on the inter-related elements of which the area transit system is a part and strong regional support for a vital and effective transportation system.

2.0 TRANSIT SERVICE ENHANCEMENTS SCENARIO

This section describes the set of transit service enhancements that were examined for their ability to divert summer Friday traffic from I-95 between Branford, CT and the Rhode Island state line. For the purposes of maintaining consistency with the remainder of the Feasibility Study, all study area service enhancements are shown as changes to, or revisions of, public transportation timetables included in Appendix 2 to the draft *Existing Conditions Study* of April 2003. Although changes to these baseline schedules were anticipated for summer 2003, the relative improvement in service levels could not be materially affected by these adjustments. Any such effect could likely be an overestimate of diversion by using the Appendix 2 schedules, especially if more Friday service is operated in the summer.

The enhancements are described in separate sections for *regional* and *local* services. These sections are followed by a description of the proposed fare structure. The regional enhancements could be intended to:

- increase the diversion of ‘reverse commuters’ and permanent resident non-work travel;
- enable summer residents to commute via transit; and
- provide convenient car-free leisure (vacationers, weekenders, and day-trippers) access to Southeastern Connecticut.

The local service enhancements were aimed primarily at making a complete visitor experience of Southeastern Connecticut possible without bringing a personal motor vehicle to the area. These services could link major attractions to selected concentrations of public accommodations.

2.1 Regional Links

Figures 1a and 1b show in schematic form the present and enhanced regional transit links. Each of the following enhancements is discussed in a separate subsection below:

- Extension of Shore Line East (SLE) service east to Westerly, RI, with additional weekday and weekend service;
- Expansion of Commuter Connection bus service in New Haven in conjunction with SLE;
- Additional trips on the DATTCO commuter bus service between Hartford and Old Saybrook;
- Additional service on CT Transit Route S between Old Saybrook and New Haven;
- A new bus service between Madison and Old Saybrook, complementing the present Shoreline Shuttle; and
- A new regional bus service between New London and Hartford via Norwich and Colchester, offering rail and bus connections north of Hartford and east of New London.

2.1.1 Shore Line East (SLE)

The enhanced services could include three significant adjustments to the SLE service as included in Appendix 2 of the draft *Existing Conditions Study*:

- New station stops. A new *seasonal* stop could be added at East Lyme/Niantic, intended to serve the summer population in the vicinity. This could be served by three trains in each direction targeted at commuters to/from the west from summer homes or rentals, and could add other Friday stops to facilitate reaching these points for the weekend. These trains could be extended to Westerly, RI, stopping at New London and Mystic. The new station would not be a year-round ‘park-and-ride’; access could be by taxi, walk, or served by passenger auto (passengers picked up or dropped off by others). No significant station structure or amenities would be provided.
- Addition of trains or stops to facilitate ‘reverse commuting’ to Guilford and Branford.
- Addition of mid-day and late evening service to serve shopping and recreational travel.

On Saturdays and Sundays, it is suggested that SLE trains making all stops could operate four times a day in each direction between New Haven and Westerly: morning, mid-day, afternoon, and evening. These schedules could be served by a single trainset.

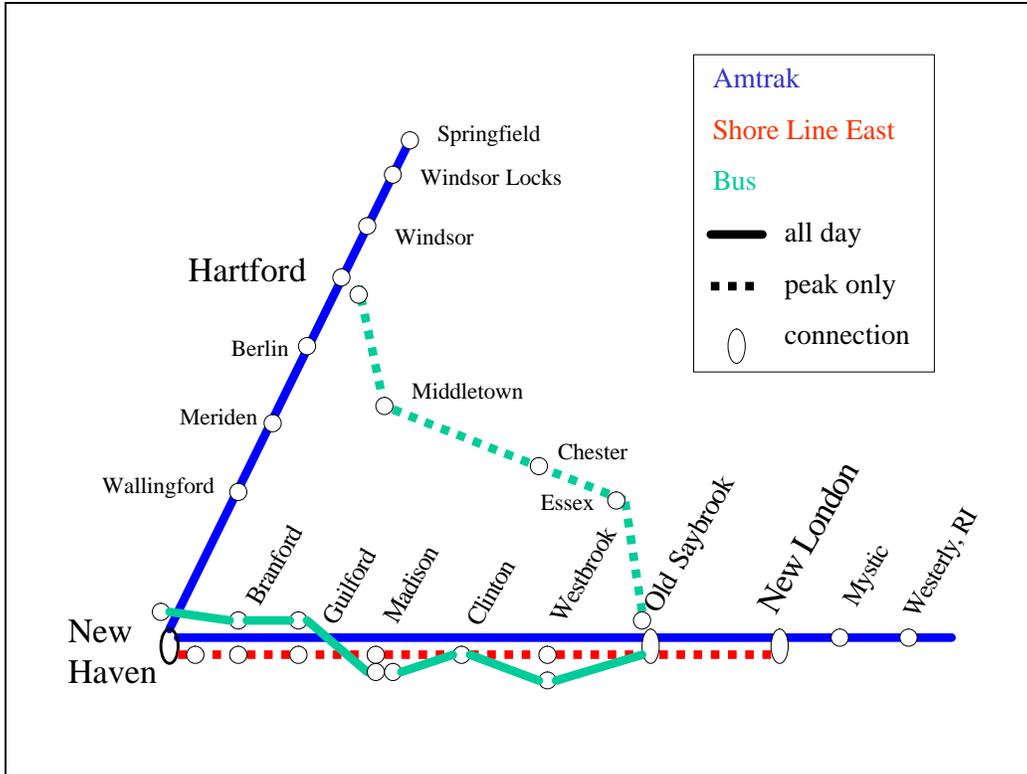


Figure 1a. Baseline Regional Links

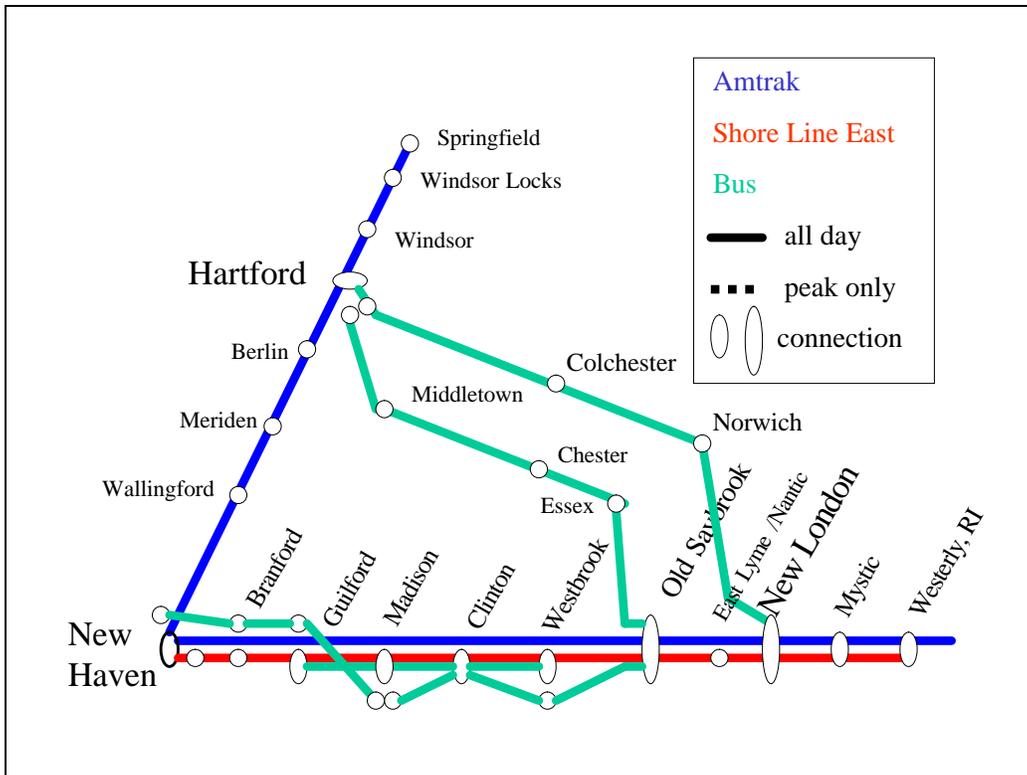


Figure 1b. Enhanced Regional Links

Tables 1 and 2 represent *approximate* timetables for the enhanced SLE weekday service with these adjustments, for eastbound and westbound service respectively. Changes relative to the SLE timetable in Appendix 2 of the Draft *Existing Conditions Study* are highlighted in **boldface**. Actual schedules that might be developed for these enhancements could be conditional on the agreement of the railroad owner (Amtrak), and could be subject to railroad operating constraints, capacity, and marine traffic considerations. Entries in italics in Tables 1 and 2 indicate bus connections via Route S4, discussed in Section 3 (Table 15).

Table 1. Proposed Eastbound Enhanced SLE Service for Summer Weekdays

Stamford	--	--	--	8:10 AM	--	--	--	--	--
South Norwalk	--	--	--	8:20 AM	--	--	--	--	--
Bridgeport	--	--	--	8:36 AM	--	--	--	--	--
Stratford	--	--	--	8:42 AM	--	--	--	--	--
Milford	--	--	--	8:48 AM	--	--	--	--	--
New Haven	5:05 AM	6:23 AM	8:30 AM	9:06 AM	10:24 AM	11:29 AM	2:10 PM	3:03 PM	4:27 PM
State Street	--	6:25 AM	8:32 AM	9:09 AM	10:26 AM	11:31 AM	2:12 PM	3:05 PM	4:29 PM
Branford	--	6:36 AM	8:43 AM	--	10:37 AM	11:42 AM	2:23 PM	3:16 PM	4:40 PM
Guilford	--	6:44 AM	8:51 AM	--	10:45 AM	11:50 AM	2:31 PM	3:24 PM	4:48 PM
Madison	--	--	--	--	10:51 AM	11:56 AM	2:37 PM	3:30 PM	4:54 PM
Clinton	--	--	--	--	10:56 AM	12:01 PM	2:42 PM	3:35 PM	4:59 PM
Westbrook	--	--	--	--	11:01 AM	12:06 PM	2:47 PM	3:40 PM	5:04 PM
Old Saybrook	5:38 AM	7:03 AM	9:10 AM	--	11:09 AM	12:14 PM	2:55 PM	3:48 PM	5:17 PM
East Lyme	--	--	--	--	11:22 AM	12:27 PM	3:08 PM	--	--
New London	6:18 AM	<i>7:37 AM</i>	--	--	11:44 AM	12:40 PM	3:21 PM	--	--
Mystic	--	--	--	--	11:55 AM	--	3:32 PM	--	--
Westerly, RI	--	--	--	--	12:07 PM	--	3:44 PM	--	--

Stamford	--	4:35 PM	5:11 PM	--	--	--	--	Fridays only
South Norwalk	--	--	--	--	--	--	--	only
Bridgeport	--	4:58 PM	5:34 PM	--	--	--	--	--
New Haven	5:02 PM	5:28 PM	6:02 PM	6:34 PM	6:55 PM	7:48 PM	8:48 PM	11:18 PM
State Street	5:04 PM	5:30 PM	6:04 PM	6:36 PM	6:57 PM	7:50 PM	8:50 PM	11:20 PM
Branford	5:15 PM	5:41 PM	6:15 PM	6:47 PM	7:08 PM	8:01 PM	9:01 PM	11:31 PM
Guilford	5:23 PM	5:49 PM	6:23 PM	6:55 PM	7:16 PM	8:09 PM	9:09 PM	11:39 PM
Madison	5:29 PM	5:55 PM	6:29 PM	7:01 PM	7:22 PM	8:15 PM	9:15 PM	11:45 PM
Clinton	5:34 PM	6:00 PM	6:34 PM	7:06 PM	7:27 PM	8:20 PM	9:20 PM	11:50 PM
Westbrook	5:39 PM	6:05 PM	6:39 PM	7:11 PM	7:32 PM	8:25 PM	9:25 PM	11:55 PM
Old Saybrook	5:47 PM	6:11 PM	6:47 PM	7:19 PM	7:40 PM	8:33 PM	9:33 PM	12:03AM
East Lyme	--	6:24 PM	--	7:32 PM	--	8:46 PM	--	--
New London	<i>6:24PM</i>	6:37 PM	<i>7:25 PM</i>	7:45 PM	--	8:59 PM	--	--
Mystic	--	6:48 PM	--	7:56 PM	--	9:10 PM	--	--
Westerly, RI	--	7:00 PM	--	8:08 PM	--	9:22 PM	--	--

Table 2. Proposed Westbound Enhanced SLE Service for Summer Weekdays

Westerly, RI	--	5:04 AM	--	6:06 AM	--	--	9:01 AM	--	--
Mystic	--	5:16 AM	--	6:18 AM	--	--	9:13 AM	--	--
New London	--	5:27 AM	5:52 AM	6:29 AM	--	7:15 AM	9:25 AM	--	12:54 PM
East Lyme	--	5:40 AM	6:05 AM	6:42 AM	--	--	--	--	--
Old Saybrook	5:30 AM	5:53 AM	6:18 AM	6:55 AM	7:20 AM	7:55 AM	9:47 AM	10:53 AM	1:16 PM
Westbrook	5:35 AM	6:07 AM	6:23 AM	7:03 AM	7:25 AM	8:00 AM	9:52 AM	10:58 AM	--
Clinton	5:40 AM	6:12 AM	6:28 AM	7:08 AM	7:30 AM	8:05 AM	9:57 AM	11:03 AM	--
Madison	5:45 AM	6:17 AM	6:33 AM	7:13 AM	7:35 AM	8:10 AM	10:02 AM	11:08 AM	--
Guilford	5:51 AM	6:23 AM	6:39 AM	7:19 AM	7:41 AM	8:16 AM	10:08 AM	11:14 AM	1:31 PM
Branford	5:59 AM	6:31 AM	6:47 AM	7:27 AM	7:49 AM	8:24 AM	10:16 AM	11:22 AM	1:39 PM
State Street	6:12 AM	6:42 AM	7:00 AM	7:38 AM	8:02 AM	8:37 AM	10:29 AM	11:35 AM	1:52 PM
New Haven	6:15 AM	6:45 AM	7:06 AM	7:43 AM	8:05 AM	8:40 AM	10:32 AM	11:38 AM	1:55 PM
Bridgeport	--	--	7:27 AM	8:03 AM	--	--	--	--	--
Stamford	--	--	7:53 AM	8:30 AM	--	--	--	--	--

Westerly, RI	2:16 PM	--	4:38 PM	--	Fridays only
Mystic	2:28 PM	--	4:50 PM	--	
New London	2:49 PM	--	5:01 PM	6:50 PM	8:50 PM
East Lyme	--	--	--	--	--
Old Saybrook	3:11 PM	4:11 PM	5:27 PM	7:16 PM	9:16 PM
Westbrook	--	--	5:32 PM	7:21 PM	--
Clinton	--	--	5:37 PM	7:26 PM	--
Madison	--	--	5:42 PM	7:31 PM	--
Guilford	3:26 PM	4:26 PM	5:48 PM	7:37 PM	9:31 PM
Branford	3:34 PM	4:34 PM	5:56 PM	7:45 PM	9:39 PM
State Street	3:47 PM	4:47 PM	6:09 PM	7:58 PM	9:52 PM
New Haven	3:50 PM	4:50 PM	6:12 PM	8:01 PM	9:55 PM
Bridgeport	--	--	--	--	--
Stamford	--	--	--	--	--

2.1.2 New Haven Commuter Connection

Relative to the Commuter Connection bus schedules effective March 10, 2003, additional bus trips could be made to connect with the enhanced SLE train service as shown in Table 3. Other adjustments could include:

- the Downtown Evening route trip departing Union Station at 8:20 PM (and Temple and Center Green at 8:34 PM) would terminate at Union Station at 8:42 PM;
- the Downtown Morning departure from State Street at 10:00 AM would be moved ahead to 10:32 AM to meet passengers from the 10:29 AM SLE arrival from New London.
- the Sargent Drive Morning 10:00 AM departure from State Street Station would be moved ahead to 10:32 AM.

Table 3. Additional Summer Weekday Commuter Connection Trips

Commuter Connection Route	Leaving	At	Connecting SLE Train
Downtown Morning	State Street	11:10 AM	11:31 AM SLE departure from State Street for New London;
Downtown Morning	State Street	11:38 AM	11:35 AM SLE arrival at State Street from Old Saybrook
Downtown Afternoon/Evening (Fridays only)	Union Station	10:00 PM	9:55 PM arrival from New London
Downtown Afternoon/Evening (Fridays only)	Union Station	10:50 PM	11:18 PM departure to Old Saybrook
Sargent Drive Afternoon/Evening	1 Long Wharf Drive	11:09 AM	11:29 AM SLE departure from Union Station for New London
Sargent Drive Afternoon/Evening	1 Long Wharf Drive	8:28 PM	8:48 PM SLE departure from Union Station for Old Saybrook
Sargent Drive Morning (modified for the PM to depart Union Station)	Union Station	8:06 PM	8:01 PM SLE arrival from New London

2.1.3 DATTCO Commuter Express (Old Saybrook – Middletown – New Haven)

The trips shown in Table 4 could be added to the service shown in the draft *Existing Conditions Study*. These new year-round trips could all make timed transfer connections at Old Saybrook with SLE service to/from New London.

Table 4. Added Weekday Service on DATTCO Commuter Express

	Inbound (to Hartford)			Outbound (from Hartford)		
Old Saybrook Center	9:55 AM	1:25 PM	7:25 PM	12:20 PM	7:10 PM	8:25 PM
Old Saybrook Commuter Lot	10:00 AM	1:30 PM	7:30 PM	12:15 PM	7:05 PM	8:20 PM
Essex Commuter Lot	10:10 AM	1:40 PM	7:40 PM	12:05 PM	6:55 PM	8:10 PM
Chester Commuter Lot	10:20 AM	1:50 PM	7:50 PM	11:55 AM	6:45 PM	8:00 PM
Middletown-Middlesex Hospital	10:40 AM	2:10 PM	8:10 PM	11:35 AM	6:25 PM	7:40 PM
Hartford- Central Row	11:03 AM	2:33 PM	8:33 PM	11:12 AM	6:00 PM	7:17 PM
Hartford –Farmington/Flower	--	2:41 PM	8:41 PM	--	5:50 PM	7:09 PM
Hartford – Farmington/Woodland	--	2:46 PM	8:46 PM	--	5:45 PM	7:04 PM

2.1.4 CT Transit Route S

Route S service could be extended into the evening on summer weekdays. Selected trips could be extended as express trips via I-95 to make transfer connections at Old Saybrook with SLE trains to/from New London. Additional service compared to the service shown in the draft *Existing Conditions Study* is shown in boldface in Table 5.

Table 5. Additional Summer Weekday Service on Route S

	New Haven	Cherry Hill	Town Green Branford	Town Green Guilford	Brookside Park Madison	Old Saybrook
Eastbound	5:40 AM	5:55 AM	6:00 AM	6:17 AM	6:35 AM	6:55 AM
Eastbound	6:15 AM	6:30 AM	6:35 AM	6:52 AM	7:10 AM	--
Eastbound	7:55 AM	8:10 AM	8:20 AM	8:37 AM	8:50 AM	--
Eastbound	8:30 AM	8:45 AM	8:50 AM	9:07 AM	9:20 AM	9:40 AM
Eastbound	9:30 AM	9:45 AM	9:50 AM	10:07 AM	10:20 AM	--
Eastbound	10:45 AM	11:00 AM	11:05 AM	11:22 AM	11:40 AM	12:00 N*
Eastbound	12:30 PM	12:45 PM	12:55 PM	1:12 PM	1:35 PM	--
Eastbound	1:30 PM	1:45 PM	1:55 PM	2:12 PM	2:35 PM	--
Eastbound	2:20 PM	2:35 PM	2:45 PM	3:02PM	3:10 PM	--
Eastbound	3:40 PM	3:55 PM	4:00 PM	4:17 PM	4:30 PM	--
Eastbound	4:15 PM	4:30 PM	4:35 PM	4:52 PM	5:10 PM	--
Eastbound	4:45 PM	5:10 PM	5:15 PM	5:32 PM	5:45 PM	6:05 PM*
Eastbound	5:30 PM	5:45 PM	5:55 PM	6:12 PM	6:25 PM	--
Eastbound	5:55 PM	6:10 PM	6:15 PM	6:32 PM	6:50 PM	7:10 PM*
Eastbound	7:10 PM	7:25 PM	7:30 PM	7:47 PM	8:05 PM	8:25 PM*
	Old Saybrook	Brookside Park Madison	Town Green Guilford	Town Green Branford	Cherry Hill	New Haven
Westbound	--	6:23 AM	6:35 AM	6:54 AM	6:58 AM	7:20 AM
Westbound	--	6:53 AM	7:04 AM	7:24 AM	7:28 AM	7:50 AM
Westbound	7:03 AM*	7:23 AM	7:35 AM	7:40 AM	7:58 AM	8:20 AM
Westbound	--	9:03 AM	9:15 AM	9:23 AM	9:37 AM	10:00 AM
Westbound	9:55AM*	10:15 AM	10:22 AM	10:35 AM	10:49 AM	11:12 AM
Westbound	--	10:38 AM	10:50 AM	11:13 AM	11:17 AM	11:45 AM
Westbound	--	12:03 PM	12:20 PM	12:38 PM	12:42 PM	1:05 PM
Westbound	1:23 PM*	1:43 PM	1:55 PM	2:13 PM	2:17 PM	2:20 PM
Westbound	--	2:43 PM	2:53 PM	3:11 PM	3:15 PM	3:37 PM
Westbound	--	3:18 PM	3:28 PM	3:46 PM	3:50 PM	4:12 PM
Westbound	--	4:33 PM	4:45 PM	5:03 PM	5:07 PM	5:30 PM
Westbound	--	5:13 PM	5:25 PM	5:43 PM	5:47 PM	6:10 PM
Westbound	5:20 PM	5:53 PM	6:05 PM	6:23 PM	6:30 PM	6:50 PM
Westbound	7:20 PM*	7:53 PM	8:05 PM	8:23 PM	8:30 PM	8:50 PM
Westbound	9:20 PM*	9:53 PM	10:05 PM	10:23 PM	10:30 PM	10:50 PM

* would make timed transfer connection to/from New London via SLE at Old Saybrook

2.1.5 DATTCO Shoreline Shuttle (Madison-Old Saybrook)

The enhanced transit service could include a supplementary service to the Shoreline Shuttle service operated by the Estuary Transit District, making timed connections at Guilford rail station with SLE trains to/from New Haven, and making local stops serving shoreline points. A few express trips could augment existing Shoreline Shuttle service to Clinton Mall. The summer weekday schedule would be as shown in Table 6.

Table 6. Additional Service to Complement Shoreline Shuttle

	Lv Guilford SLE Station	Lv Neck Road ¹	Lv Madison SLE Station	Lv Liberty Street ²	Lv Hammon-asset S.P.	Lv Clinton SLE Station	Lv Grove Beach Road	Ar West-brook SLE Station	Westbrook Factory Stores	
Eastbound	6:47 AM*	-----EXPRESS via I-95 ----->								7:10 AM
Eastbound	6:50 AM*	7:03 AM	7:08 AM	7:12 AM	7:17 AM	7:23 AM	7:32 AM	7:40 AM	7:45 AM	
Eastbound	9:00 AM*	9:13 AM	9:18 AM	9:22 AM	9:27 AM	9:33 AM	9:42 AM	9:50 AM	9:55 AM	
Eastbound	12:00 N*	12:13 PM	12:18 PM	12:22 PM	12:27 PM	12:33 PM	12:42 PM	12:50 PM	12:55 PM	
Eastbound	2:40 PM*	2:53 PM	2:58 PM	3:02 PM	3:07 PM	3:13 PM	3:22 PM	3:30 PM	3:35 PM	
Eastbound	3:30 PM*	3:43 PM	3:48 PM	3:52 PM	3:57 PM	4:03 PM	4:12 PM	4:20 PM	4:25 PM	
Eastbound	4:55 PM*	5:08 PM	5:13 PM	5:17 PM	5:22 PM	5:28 PM	5:37 PM	5:45 PM	5:50 PM	
Eastbound	5:55 PM*	6:08 PM	6:13 PM	6:17 PM	6:22 PM	6:28 PM	6:37 PM	6:45 PM	6:50 PM	
Eastbound	7:25 PM*	7:38 PM	7:43 PM	7:47 PM	7:52 PM	7:58 PM	8:07 PM	8:15 PM	--	
Eastbound	8:15 PM*	8:28 PM	8:33 PM	8:37 PM	8:42 PM	8:48 PM	8:57 PM	9:05 PM	--	
Eastbound	9:35 PM*	9:48 PM	9:53 PM	9:57 PM	10:02 PM	10:08 PM	10:17 PM	10:25 PM	--	
	Westbrook Factory Stores	Lv West-brook SLE Station	Lv Grove Beach Road	Lv Clinton SLE Station	Lv Hammon-asset S.P. Entrance	Lv Liberty Street	Lv Madison SLE Station	Lv Neck Road	Ar Guilford SLE Station	
Westbound	--	5:25 AM	5:33 AM	5:42 AM	5:48 AM	5:53 AM	5:57 AM	6:02 AM	6:15 AM*	
Westbound	7:15 AM	7:20 AM	7:28 AM	7:37 AM	7:43 AM	7:48 AM	7:52 AM	7:57 AM	8:10 AM*	
Westbound	8:00 AM	8:05 AM	8:13 AM	8:22 AM	8:28 AM	8:33 AM	8:37 AM	8:42 AM	8:55 AM	
Westbound	10:10 AM	10:15 AM	10:23 AM	10:32 AM	10:38 AM	10:43 AM	10:47 AM	10:52 AM	11:05 AM*	
Westbound	12:30 PM	12:35 PM	12:43 PM	12:52 PM	12:58 PM	1:03 PM	1:07 PM	1:12 PM	1:25 PM*	
Westbound	2:25 PM	2:30 PM	2:38 PM	2:47 PM	2:53 PM	2:58 PM	3:02 PM	3:07 PM	3:20 PM*	
Westbound	3:40 PM	-----SHOPPERS' EXPRESS via I-95 (stops at Clinton Mall at 4:00 PM) ----->								4:20 PM*
Westbound	4:45 PM	4:50 PM	4:58 PM	5:07 PM	5:13 PM	5:18 PM	5:22 PM	5:27 PM	5:40 PM*	
Westbound	6:55 PM	-----EXPRESS via I-95 ----->								7:30 PM*
Westbound	7:25 PM	7:30 PM	7:38 PM	7:47 PM	7:53 PM	7:58 PM	8:02 PM	8:07 PM	8:20 PM*	
Westbound	8:25 PM	- SHOPPERS' EXPRESS (stops at Clinton Mall at 8:35 PM) ->						8:42 PM	8:47 PM	9:00 PM*

* would make timed transfer connection via SLE to/from New Haven

¹ Local stop for beachfront residences.

² Local stop for Seaview and Middle Beaches.

2.1.6 New Regional Service (Hartford – Norwich – New London)

The transit enhancements could include a new regional bus service, generally similar to the present DATTCO Commuter Express at the enhanced service level described in Section 2.1.3. High-speed year-round service could connect urban centers and selected commuter lots. A proposed timetable is shown in Tables 7 and 8. These buses could be timed to make connections with Amtrak (**boldface**) or Peter Pan Bus Lines (*italics*) service to/from Springfield, MA. Some bus trips could offer through connections between Mystic and Westerly via SLE and points north of Hartford (underlined).

Table 7. North/Westbound Regional Service (New London – Norwich – Hartford)

Lv New London (Water St.)	<u>5:35a</u>	<u>6:45a</u>	8:15a	<u>9:45a</u>	11:15a	1:20p	3:20p	4:40p	6:30p	7:45p
Lv Norwich Transportation Center	5:59a	7:09a	8:39a	10:09a	11:39a	1:44p	3:44p	5:04p	6:54p	8:09p
Lv Colchester Lake Hayward P&R Lot	6:15a	7:25a	8:55a	10:25a	11:55a	2:00p	4:00p	5:20p	7:10p	8:25p
Lv Colchester Green	6:18a	7:28a	8:58a	10:28a	11:58a	2:03p	4:03p	5:23p	7:13p	8:28p
Hartford - Central Row North	6:50a	8:00a	9:30a	11:00a	12:30p	2:35p	4:35p	5:55p	7:45p	9:00p
Hartford – Union Station	6:55a	8:05a	9:35a	<u>11:05a</u>	12:35p	2:40p	<u>4:40p</u>	6:00p	7:50p	9:05p

Connections northward to Springfield, MA via **Amtrak** or *Peter Pan Bus*

Connections westward from Mystic and Westerly via SLE

Table 8. South/Eastbound Regional Service (Hartford – Norwich – New London)

Lv Hartford – Union Station	6:45a	<i>8:15a</i>	9:45a	11:50a	1:50p	<i>3:00p</i>	<i>5:00p</i>	<i>6:10p</i>	7:25p	9:10p
Lv Hartford – Central Row South	6:50a	8:20a	9:50a	11:55a	1:55p	3:05p	5:05p	6:15p	7:30p	9:15p
Lv Colchester Green	7:22a	8:52a	10:22a	12:27p	2:27p	3:37p	5:37p	6:47p	8:02p	9:47p
Lv Colchester Lake Hayward P&R Lot	7:25a	8:55a	10:25a	12:30p	2:30p	3:40p	5:40p	6:50p	8:05p	9:50p
Lv Norwich Transportation Center	7:41a	9:11a	10:41a	12:46p	2:46p	3:56p	5:56p	7:16p	8:21p	10:16p
Ar New London (Water St.)	8:05a	9:35a	11:05a	1:10p	<u>3:10p</u>	4:20p	<u>6:20p</u>	<u>7:30p</u>	<u>8:45p</u>	10:30p

Connections southward from Springfield, MA via **Amtrak** or *Peter Pan Bus* or **both**.

Connections eastward to Mystic and Westerly via SLE

2.2 Local Service Enhancements

Except as noted in this section, local bus services shown in the draft *Existing Conditions Study* could be operated as shown therein. All changes in this section could be additions to these services. These changes are shown in schematic form in Figure 2.

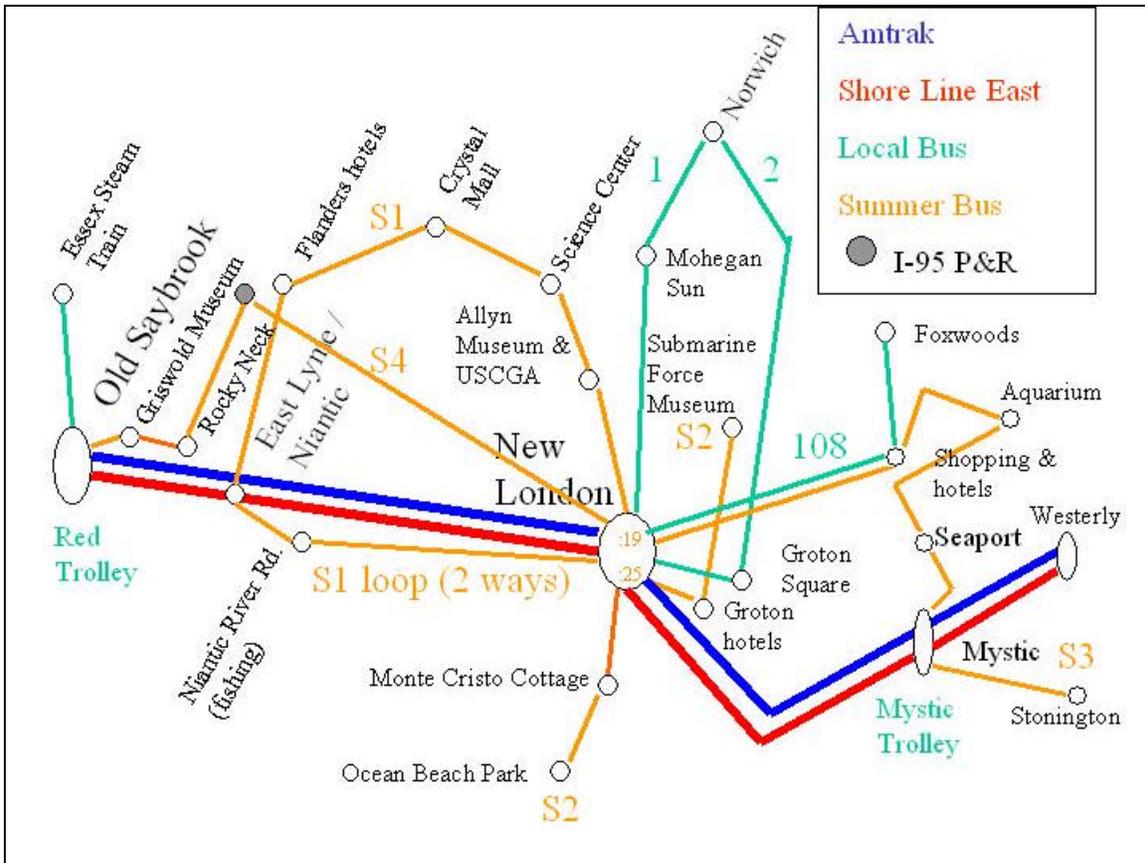


Figure 2. Local Service Enhancements

2.2.1 CT Transit North Branford Route L

Weekday trips could be added to the service effective December 15, 2002 as follows:

- Inbound signed ‘D5’, departing Route 80 & North Branford Elementary at 10:57 AM, arriving Downtown New Haven (Church and Center) 11:48 AM;
- Outbound signed ‘L1’ leaving downtown New Haven 12:05 PM, arriving Route 80 & North Branford Elementary at 12:42 PM.
- Outbound signed ‘L1’ (stopping at Woodview Apartments) leaving downtown New Haven 6:35 PM, arriving Route 80 & North Branford Elementary at 7:12 PM.

2.2.2 CT Transit East Haven Route F

Weekday summer service on the F3 branch could be extended into the evening. Buses could depart downtown New Haven (Chapel east of Church) hourly between 6:20 PM and 11:20 PM, returning from Branford Green hourly between 6:04 PM and 11:04 PM.

2.2.3 South East Area Transit (SEAT) Routes

The basic summer weekday service frequency on SEAT Run #1 could be increased to hourly, and evening trips could be added as shown in Table 9. Saturday service would remain unchanged.

Table 9. SEAT Run #1 Weekday Service

Lv New London	--	--	7:00 AM	Hourly service until	5:00 PM	6:00 PM	7:00 PM	9:10 PM*
Route 32/163	--	--	7:20 AM		5:20 PM	6:20 PM	7:20 PM	9:30PM
Mohegan Sun	--	--	7:40 AM		5:40 PM	6:40 PM	7:40 PM	9:50 PM
Uncas-on-Thames	--	--	7:45 AM		5:45 PM	6:45 PM	7:45 PM	9:55 PM
Norwich Trans. Ctr	6:00 AM	7:00 AM	8:00 AM		6:00 PM	7:00 PM	8:00 PM	10:10 PM
Uncas-on-Thames	6:15 AM	7:15 AM	8:15 AM		6:15 PM	--	8:15 PM	--
Mohegan Sun	6:20 AM	7:20 AM	8:20 AM		6:20 PM	--	8:20 PM	--
Route 32/163	6:35 AM	7:35 AM	8:35 AM		6:35 PM	--	8:35 PM	--
Ar New London	6:55 AM	7:55 AM	8:55 AM		6:55 PM	--	8:55 PM	--

* Timed transfer from 8:59 PM SLE arrival from New Haven.

Additional weekday trips that could operate for SEAT Run #2 are shown in Table 10; Saturday service would remain unchanged. These trips could make timed transfer connections with the 6:37 and 8:59 PM arrivals in New London from New Haven, and with the 8:50 PM departure to New Haven from New London.

Table 10. Additional SEAT Run #2 Trips for Summer Weekdays

Lv Norwich Trans. Center	--	7:40PM
Sub Base	--	8:05 PM
Plaza Court	--	8:25 PM
Ar New London (Water St.)	--	8:40 PM
Lv New London	6:45 PM	9:10 PM
Groton Square	7:00 PM	9:25 PM
Sub Base	7:10 PM	9:35 PM
Norwich Hospital	7:30 PM	9:55 PM
Ar Norwich Trans. Center	7:40 PM	10:05 PM

An additional southbound weekday evening trip could be operated on SEAT Run #108, leaving Foxwoods Casino at 8:10 PM, and arriving at New London Amtrak/SLE station at 8:40 PM. Passengers from this trip could connect to Amtrak’s eastbound 9:08 PM *Acela Express* departure for Boston, the 8:59 eastward SLE train to Mystic and Westerly, or (on Fridays only) the 8:50 PM westward SLE departure for New Haven. The return trip of Run #108 could leave New London at 9:05 PM, arriving Foxwoods at 9:35 PM with passengers from the 8:22 PM westbound Amtrak arrival from Boston, and the 8:59 PM eastbound SLE train from New Haven.

2.2.4 New Local Bus Service in SEAT Service Area – Summer Routes (S1, S2, S3, S4)

Three new summer-only routes could provide daily limited-stop service between concentrations of potential summer accommodations (in central Groton and in Flanders village off I-95 Exit 74) and key attraction locations in Niantic, New London, Mystic, and Stonington. Connections to the regional services defined in Section 2 could be available at New London, and to a lesser extent at East Lyme and Mystic. Each of these routes could serve both a major concentration of overnight accommodations and two or more vacation attractions. A fourth route could link New London and Old Saybrook for commuters, and could make Rocky Neck State Park, the Florence Griswold Museum, and Old Saybrook accessible to the users of the other summer routes. In conjunction with the regional transit services, these four routes could make it possible for recreational travelers to have a relatively complete experience of the southeastern coastal area without bringing their car into the area. All trips on these four routes could operate daily, including Saturdays and Sundays, except as specifically noted for Route S4.

Route S1, a New London-Niantic-Waterford loop, could operate hourly in both the clockwise and counterclockwise directions, as shown in Tables 11 and 12. It could provide access both to people staying in hotel/motel ‘strip’ on Flanders Road south of I-95 Exit 74 and to summer residents of East Lyme/Niantic. Direct service could be provided to shopping (Crystal Mall), recreation (McCook Beach), museums (Children’s Museum of Southeastern Connecticut, Science Center of Eastern Connecticut, Lyman Allyn Art Museum) and other points of interest (US Coast Guard Academy, deep sea fishing, and central New London). With a single time-coordinated transfer at New London, passengers could reach the attractions on Routes S2, S3, and S4. The route

could also provide access to and from the East Lyme SLE station for people staying in the Flanders Road accommodations, and could offer an opportunity for people to use the commuter park-and-ride lots near I-95 Exit 74 to avoid driving into the waterfront area.

Major routing segments for Route S1 clockwise from Crystal Mall could be: Broad Street (SR85); Briggs Street; Williams Street; Gallows Lane; Williams Street; Water Street; US Route 1 (Bank Street and Boston Post Road); SR 156 (Rope Ferry Road and Main Street); SR 161 (Flanders Road); I-95; and Broad Street (SR 85).

Route S2 could operate between the Submarine Force Museum in Groton and Ocean Beach Park in New London, via central New London and motels in central Groton. The service could connect passengers from Routes S1 and S3 to Ocean Beach Park and the Submarine Museum, while offering people staying at the Groton motels assured connections to many area attractions via Routes S1, S3 and S4. This route could operate hourly as shown in Table 13.

Major routing segments for Route S2 northward from Ocean Beach Park could be: Pequot Avenue; Shaw Street; Water Street; I-95; Bridge Street (Groton); King's Highway; Gold Star Highway; SR 12; and Crystal Lake Road.

Route S3 could operate between the Mystic Aquarium and New London, with limited stops at motels, Mystick Village/Mystic Factory Outlets, Mystic (railroad station and Welcome Center), Mystic Seaport and Stonington Village. This route could operate hourly as shown in Table 14.

Major routing segments for Route S3 eastward from New London could be: Water Street; I-95; SR 27 (Mystic); Coogan Boulevard; Jerry Brown Road; SR 27 (Greenmanville Avenue); US Route 1 (Williams Avenue, Stonington Westerly Road); and North Water Street (Stonington).

Improvements in SEAT service frequency on Run #1 could make it reasonably convenient for passengers from the new summer routes to reach the Mohegan Sun complex from any of the summer routes, making a single change of vehicle at New London. Run #108 service connecting to Foxwoods Casino at New London (routes S1, S2, and S3) and Mystick Village (route S3) could also make this attraction accessible.

In addition to the trips shown, two late evening summer bus departures from Ocean Beach Park could operate on 'Beach Blanket Movie' nights, Fridays and Saturdays, and on other dates where major entertainment is scheduled at the park. These buses could depart about 15 minutes after the conclusion of the evening's entertainment. One could operate on the S2 routing to New London station, then follow the clockwise route of the S1 service to the Flanders Road motels and Exit 74 park-and-ride via Niantic. The other could operate non-stop to the Groton motels served by the S2 route, then could run express on I-95 to the Mystic hotels served by route S3.

Route S4 could operate between Old Saybrook and New London as shown in Table 15. Routing could be (listed west to east): Old Saybrook Station, Boston Post Road, Route 1, Lyme Street (to/from Griswold Museum), I-95, Exit 72 and Rocky Neck Connector to/from Rocky Neck State Park, I-95, Exit 74 to/from park-and-ride, I-95 to Water Street and New London Station. In addition to making the town of Old Saybrook, the Griswold Museum, and Rocky Neck State Park accessible to summer bus system users, weekday trips bypassing these attractions could operate to serve commuters between Old Saybrook and New London.

Table 11. Route S1 – Clockwise Daily Service (New London – Niantic/East Lyme)

Crystal Mall	--	8:00a	Hourly service until	6:00p	7:00p	8:00p
Science Center	--	8:10a		6:10p	7:10p	8:10p
Lyman Allyn Museum ³	--	8:13a		6:13p	7:13p	8:13p
Ar New London (Water St.)	--	8:19a		6:19p	7:19p	8:19p
Lv New London	7:25a	8:25a		6:25p	7:25p	8:40p
Fishing Fleet (Niantic River Rd)	7:38a	8:38a		6:38p	7:38p	8:53p
Niantic (Main & Methodist)	7:40a	8:40a		6:40p	7:40p	8:55p
Flanders Road Hotels	7:50a	8:50a		6:50	7:50	9:05p
Crystal Mall	8:00a	9:00a		7:00p	8:00p	--

Boldface indicates timed transfer connections from SLE train from New Haven to Flanders Road hotels.

³ Also serves US Coast Guard Academy

**Table 12. Route S1 – Counterclockwise Daily Service
(New London – Niantic/East Lyme)**

Crystal Mall	--	--	8:44a	hourly service until	8:44p	9:44p
Flanders Rd Hotels	6:24a	7:54a	8:54a		8:54p	9:54p
Niantic (Main & Methodist)	6:34a	8:04a	9:04a		9:04p	--
Fishing Fleet (Niantic River Rd)	6:36a	8:06a	9:06a		9:06a	--
Ar New London (Water St.)	6:49a	8:19a	9:19a		9:19p	--
Lv New London	--	8:25a	9:25a		9:25p	--
US Coast Guard Academy ⁴	--	8:31a	9:31a		9:31p	--
Science Center	--	8:34a	9:34a		9:34p	--
Crystal Mall	--	8:44a	9:44a		9:44p	--

Boldface indicates timed transfer connection to SLE train to New Haven from Flanders Road hotels.

⁴ Also serves Lyman Allyn Museum

**Table 13. Route S2 Daily Service
(Ocean Beach Park – New London – Groton Hotels – Submarine Museum)**

Lv Submarine Force Museum ⁵	--	7:57a	hourly service until	7:57p
Lv BW Olympic (across SR 12)	--	8:02a		8:02p
Lv Super 8	--	8:04a		8:04p
Lv Groton Inn	--	8:08a		8:08p
Lv Econo Lodge (across Bridge St.)	--	8:12a		8:12p
Ar New London	--	8:19a		8:19p
Lv New London	--	8:25a		8:25p
Lv Monte Carlo Cottage	--	8:32a		8:32p
Ar Ocean Beach Park	--	8:40a		8:40p
Lv Ocean Beach Park	--	9:04a		9:04p
Lv Monte Carlo Cottage	--	9:12a		9:12p
Ar New London	--	9:19a		9:19p
Lv New London	8:25a	9:25a		9:25p
Lv Econo Lodge	8:32a	9:32a		9:32p
Lv Clarion Inn	8:36a	9:36a		9:36p
Lv Super 8 (across SR 12)	8:40a	9:40a		9:40p
Lv Best Western Olympic	8:42a	9:42a		9:42p
Ar Submarine Force Museum ³	8:47a	9:47a	9:47p	

⁵ Stops at Submarine Base outside of Museum hours.

Table 14. Route S3 Daily Service (Stonington Village – Mystic – New London)

Lv Stonington Village	7:30a	hourly service until	5:30p	6:35p	7:35p	8:35p
Lv Mystic	7:44a		5:44p	6:48p	7:48p	8:48p
Lv Mystic Seaport	7:48a		5:48p	--	--	--
Lv Coogan Blvd & SR27	7:52a		5:52p	6:54p	7:54p	8:54p
Lv Mystic Aquarium	7:55a		5:55p	--	--	--
Lv Comfort Inn Mystic	8:01a		6:01p	7:01p	8:01p	9:01p
Ar New London	8:19a		6:19p	7:19p	8:19p	9:19p
Lv New London	8:25a		6:25p	7:25p	8:25p	9:25p
Lv Days Inn. Mystic	8:43a		6:43p	7:43p	8:43p	9:43p
Lv Mystic Aquarium	8:49a		6:49p	--	--	--
Lv Coogan Blvd & SR27	8:52a		6:52p	7:50p	8:50p	9:50p
Lv Mystic Seaport	8:56a		6:56p	--	--	--
Lv Mystic	9:00a		7:00p	8:00p	8:56p ⁶	9:56p ⁶
Ar Stonington Village	9:15a		7:15p	8:15p	--	--

⁶ Arrival time. Trip ends at Mystic.

Table 15. Route S4 Service (Old Saybrook – New London)

Lv Old Saybrook	--	7:08a*	7:45a	8:27a	Hourly service until	3:27p	4:27p	5:27p	5:55p*	7:00p*
Lv Florence Griswold Museum	--	--	--	8:37a		3:37p	4:37p	5:37p	--	--
Lv Rocky Neck State Park	--	--	--	8:52a		3:52p	4:52p	5:52p	--	--
Lv Park-and-Ride (I-95 Exit 74)	--	7:25a	8:07a	9:07a		4:07p	5:07p	6:07p	6:12p	--
Ar New London	--	7:37a	8:19a	9:19a		4:19p	5:19p	6:19p	6:24p	7:25p
Lv New London	7:15a	7:45a	8:25a	9:25a		4:25p	5:25p	--	6:30p	--
Lv Park-and-Ride (I-95 Exit 74)	7:27a	7:57a	8:37a	9:37a		4:37p	5:37p	--	6:42p	--
Lv Rocky Neck State Park	--	--	8:52a	9:52a		4:52p	--	--	--	--
Lv Florence Griswold Museum	--	--	9:07a	10:07a		5:07p	--	--	--	--
Ar Old Saybrook	7:44a*	8:14a	9:17a	10:17a		5:17p	5:54p	--	6:59p	--
Operates	Monday-Friday		Daily			Daily				Monday-Friday

* Timed connection with SLE train to/from New Haven

2.2.5 Local 'Trolley' Services

Local tourist attractions in Old Saybrook and Mystic can also be reached by 'trolley' services established in these towns. These services are operated by rubber-tired buses built to appear as electric streetcars (or trolley cars). This type of service has been successful along major highway routes with high tourist accommodation and attraction densities, such as US Route 1 in Wells and Ogunquit, Maine, and Route 108 in Stowe, Vermont. These services can reduce the amount of auto traffic from short trips between accommodations and restaurants or attractions. They are a natural complement to other bus services (such as services S1, S2, S3, and S4 described above) that can make the attractions and accommodations accessible to people visiting the area. One shortcoming of these services in other areas has been the lack of coordination between such services in adjacent towns, and their generally low speeds, as they tend to directly serve many of the businesses that contribute to their operating costs.

Old Saybrook’s ‘Jolly Red Trolley’ operates hourly in the summer between 9:00 AM and 10:00 PM. It operates in a loop serving the Amtrak/SLE station, the Old Saybrook Shopping Center (OSSC), marinas, the high school, the Town Green, Saybrook Point Inn, and many other points. The Trolley provides a narrated tour, and is considered an attraction in its own right. It makes a connection with a Westbrook Trolley at the high school. These services would remain unchanged. Two additional trips (without narration) could be added to the Old Saybrook Trolley weekday schedule: a departure from the Amtrak/SLE station at 7:25 PM, serving passengers from both the 7:19 SLE arrival from New Haven, and the 7:16 PM SLE arrival from New London. This trip could return to the station at 8:15 PM, and depart again at 8:40 PM, serving passengers from the 8:33 PM SLE arrival from New Haven. Returning to the station at 9:05 PM, this trip could also make a connection with the 9:16 SLE departure for New Haven.

During the day on weekdays, and on Saturdays and Sundays, the ‘trolley’ vehicle used to add these weekday evening trips could be employed as a tourist shuttle between Old Saybrook and the Essex Steam Train & Riverboat attraction, operating at 45-minute intervals. Connections with other rail and bus services could be as shown in Table 16. In this table, the supplemental ‘trolley’ service is shown in plain text, the steam train summer weekday service is shown in **boldface**, and the principal regional connections are shown in *italics*. This service makes it possible for people staying at the ‘summer route’ accommodations to experience the steam train without bringing a car; connecting time before or after the train trip could be used to visit the Essex Station site.

Table 16. Supplemental Daily ‘Trolley’ Service to/from Essex Steam Train & Riverboat

Lv New London	<i>8:25a (S4)</i>	<i>9:25a (S4)</i>	--	<i>11:15a (Amtrak)</i>	--	<i>12:54p (SLE)</i>	--	--	<i>2:49p (SLE)</i>	--
Lv New Haven	<i>8:30a (SLE)</i>	--	<i>10:24a (SLE)</i>	--	<i>11:29a (SLE)</i>	--	--	<i>2:10p (SLE)</i>	<i>2:41p (Amtrak)</i>	--
Lv Old Saybrook	9:45a	10:30a	11:15a	12:00n	12:45p	1:30p	2:15p	3:00p	3:45p	4:30p
Ar Essex	10:00a	10:45a	11:30a	12:15p	1:00p	1:45p	2:30p	3:15p	4:00p	4:45p
Lv Essex	10:30a	--	12:00n	--	1:30p	--	3:00p	--	4:30p	--
Minimum steam train trip duration 1 hour										
Ar Essex	--	--	11:30a	--	1:00p	--	2:30p	--	--	5:30p
Lv Essex	10:10a	10:55a	11:40a	12:25p	1:10p	1:55p	2:40p	3:25p	4:10p	5:45p
Ar Old Saybrook	10:25a	11:10a	11:55a	12:40p	1:25p	2:10p	2:55p	3:40p	4:25p	6:00p
Ar New Haven	<i>11:38a (SLE)</i>	<i>12:08p (Amtrak)</i>	--	<i>1:55p (SLE)</i>	<i>2:09p (Amtrak)</i>	--	<i>3:50p (SLE)</i>	--	--	<i>8:01p (SLE)</i>
Ar New London	<i>11:44a (SLE)</i>	<i>12:19p (S4)</i>	<i>12:40p (SLE)</i>	<i>2:19p (S4)</i>	--	<i>3:19p (S4)</i>	<i>4:19p (S4)</i>	<i>5:19p (S4)</i>	--	<i>6:37p (SLE)</i>

The Mystic Trolley operates hourly in the summer between 9:00 AM and 7:00 PM. It connects the hotels near I-95 Exit 90 with the Seaport, the Carousel Museum, and the railroad depot/Welcome Center. In conjunction with the other transit service enhancements, arrangements could be made for joint ticketing on the Trolley and summer bus services, so that visitors could use either service within Mystic. Mystic Trolley base service could be extended two hours to 9:00 PM.

2.3 Fares

Fares for new and enhanced services could be kept in line with the fares presently in effect on local and regional services. These levels represent the cumulative effects of decades of political deliberation and decision-making. The fares are generally at levels, which will not allow further decreases to attract ridership without increasing the subsidy requirements to operate the services.

This section contains details on the fares for specific services that cannot be easily inferred or extrapolated from the existing fare structures.

2.3.1 Shore Line East

Fares between all points already served could remain unchanged. Fares between the new East Lyme/Niantic stop and other existing stations could be the average of the fares applicable to/from Old Saybrook and to/from New London. These would be rounded to the nearest 25 cents for one-way travel, and to the nearest whole dollar for ten-trip, monthly, Monthly Plus (including New Haven Commuter Connection bus service), and Uni-Rail (joint SLE/Metro North) fares.

Fares out of Westerly and Mystic to points west of New London could have increments over the fares applicable between these points and New London as shown in Table 17.

Table 17. SLE Fare Supplements East of New London

	Mystic	Westerly
One Way	\$1.25	\$2.50
Ten Rides	\$11.00	\$23.00
Monthly & Monthly Plus	\$27.00	\$54.00
Uni-Rail (Uniticket)	\$26.00	\$52.00

Fares between the new SLE stations would be as shown in Table 18.

Table 18. SLE Fares Between New Stations

Station Pair	One Way	Ten Rides	Monthly
East Lyme – New London	\$3.50	\$32.00	\$66.00
East Lyme - Mystic	\$3.50	\$32.00	\$66.00
East Lyme – Westerly	\$3.75	\$34.00	\$79.00
New London – Mystic	\$3.50	\$32.00	\$66.00
New London - Westerly	\$3.50	\$32.00	\$66.00
Mystic – Westerly	\$2.25	\$20.00	\$46.00

2.3.2 New Regional Bus Service (Hartford – Colchester – Norwich – New London)

The regional bus fares for the new Hartford-New London service via Colchester and Norwich could have fare levels similar to SLE, as shown in Table 19. Through fares could be offered to SLE stations east of New London.

Table 19. Regional Bus Fares (and Through Fares on SLE)

Station Pair	One Way	Ten Rides	Monthly
Hartford-Colchester	\$4.50	\$41.00	\$101.00
Hartford-Norwich	\$6.75	\$62.00	\$150.00
Hartford-New London	\$9.00	\$80.00	\$193.00
Hartford-Mystic	\$10.00	\$91.00	\$219.00
Hartford-Westerly	\$11.50	\$103.00	\$248.00
Colchester-Norwich	\$3.50	\$32.00	\$66.00
Colchester-New London	\$5.25	\$47.00	\$116.00
Colchester-Mystic	\$6.50	\$59.00	\$143.00
Colchester-Westerly	\$7.75	\$71.00	\$171.00
Norwich-New London	\$3.50	\$32.00	\$66.00
Norwich-Mystic	\$4.25	\$40.00	\$93.00
Norwich-Westerly	\$5.50	\$50.00	\$122.00

2.3.3 Supplemental Regional and Local Bus Services

Summer bus routes S1, S2, and S3 could use the SEAT fare structure, and could both issue and honor transfers to/from local SEAT service without charge. The supplemental Madison-Westbrook Shoreline Shuttle service could use the Estuary Transit District fare structure, and could provide free transfers to and from both the existing Shoreline Shuttle service and the DATTCO ‘S’ route. Summer bus route S4 could collect a flat fare of \$2.50. Holders of transfers from Estuary Transit District service and SEAT service, and holders of SLE monthly passes, would pay a reduced fare of \$1.50.

2.3.4 Summer Visitor Passes

Two forms of summer visitor pass could be offered: ‘bus only’ and ‘bus plus rail’. Both passes could include unlimited travel for the duration of the pass on: all SEAT service, all Estuary Transit District local service, Shoreline Shuttle routes, all four ‘summer bus’ services (routes S1, S2, S3, and S4), and all town ‘trolley’ services (Mystic, Westbrook, and Old Saybrook, including service to/from Essex Steam Train & Riverboat). ‘Bus plus rail’ passes could also include unlimited travel on Shore Line East trains between all points east of (but not including) New Haven, and unlimited travel on CT Transit Route S east of New Haven. Passes for different group sizes and durations could be priced as shown in Table 20, and could be available for single days, three consecutive days, or seven consecutive days.

Table 20. Summer Visitor Pass Prices

Duration (consecutive) ->	Bus Only			Bus Plus Rail		
	1 Day	3 Days	7 Days	1 Day	3 Days	7 Days
Single Adult	\$6.00	\$12.00	\$18.00	\$15.00	\$30.00	\$45.00
Family (up to five persons, at least one 18 years or older)	\$13.00	\$25.00	\$38.00	\$32.00	\$63.00	\$95.00
Discounted Family (families purchasing round trip transportation on Amtrak (to/from points east of Kingston, RI or west of Stamford, CT) or interstate bus	Not offered			\$22.00	\$38.00	\$60.00

3.0 I-95 TRAFFIC DIVERSION RESULTING FROM TRANSIT ENHANCEMENTS

The transit enhancements could change the choices made by some travelers in the study area. This section presents the results of the travel demand forecasts made for this analysis; the techniques employed are discussed in Section 6. These forecasts were made in two discrete steps:

- Step 1, in which the normal weekday traveler response to the enhancements was estimated using ConnDOT's established statewide travel demand model. This accounts primarily for travel made by residents, although it does have a non-home-based demand component. Step 1 may be thought of as the sum of 'normal weekday' or 'resident' travel, and non-leisure trips by visitors.
- Step 2, in which the shift in travel choices made by leisure travel visitors to Southeastern Connecticut was estimated.

Although it is possible that there was some 'double-counting' between Step 1 non-home-based travel and Step 2 travel, combining both of these estimates made it less likely that the total diversion of travel to transit could be underestimated.

Figure 3 shows the estimated year 2025 summer Friday average daily traffic volumes along I-95 through the study area, including ramp volumes, for the baseline case (i.e. without transit enhancements or additional roadway capacity). Figure 4 shows the total estimated decrease in Friday peak hour vehicle movements caused by the shifts in both Step 1 and Step 2 travel. Generally, these changes correspond to a decrease of between 0.5 percent and 1.5 percent in peak hour traffic volumes. Table 21 shows the estimated changes on a link-by-link basis between interchanges.

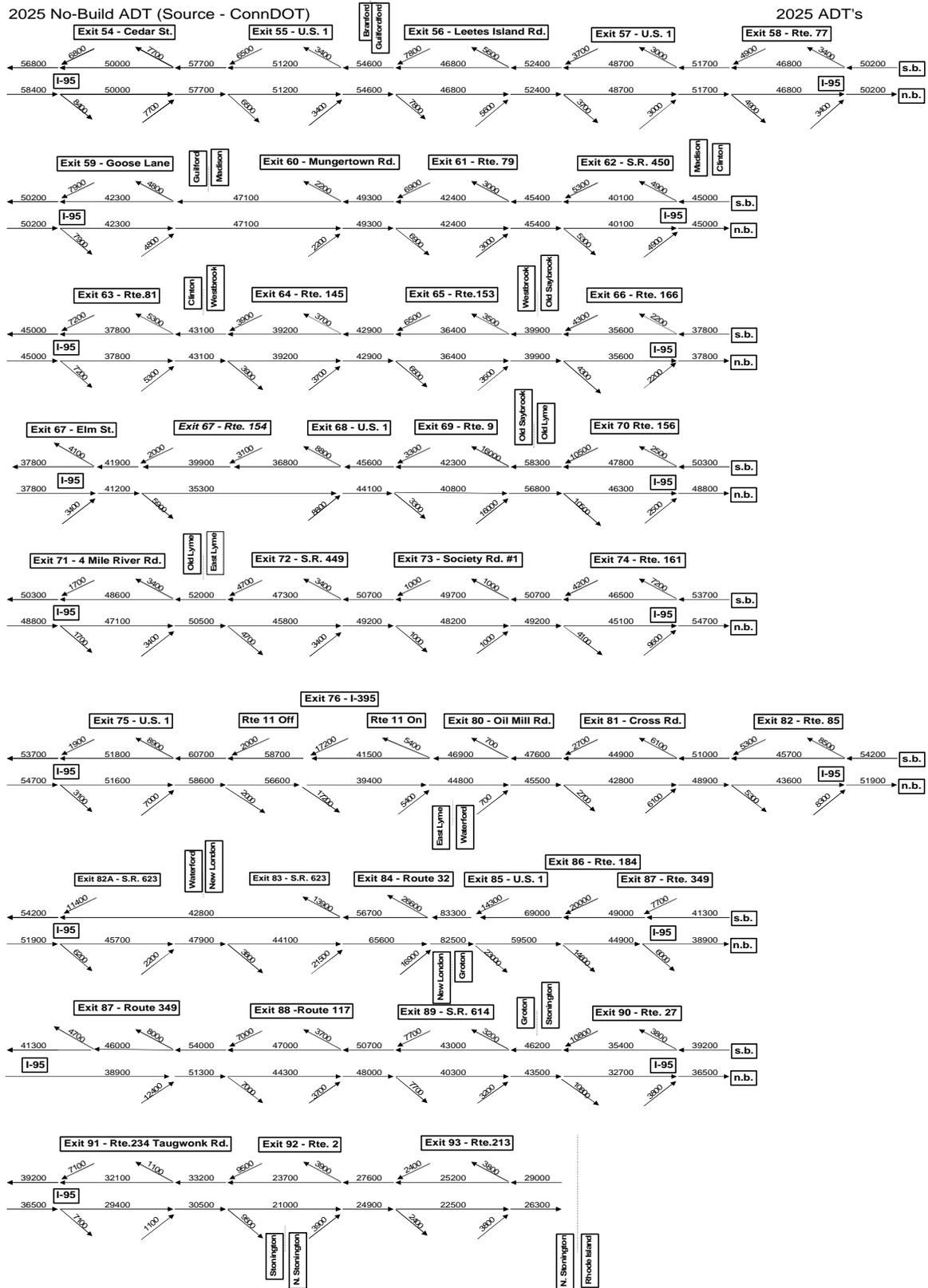


Figure 3 2025 No-Build ADT

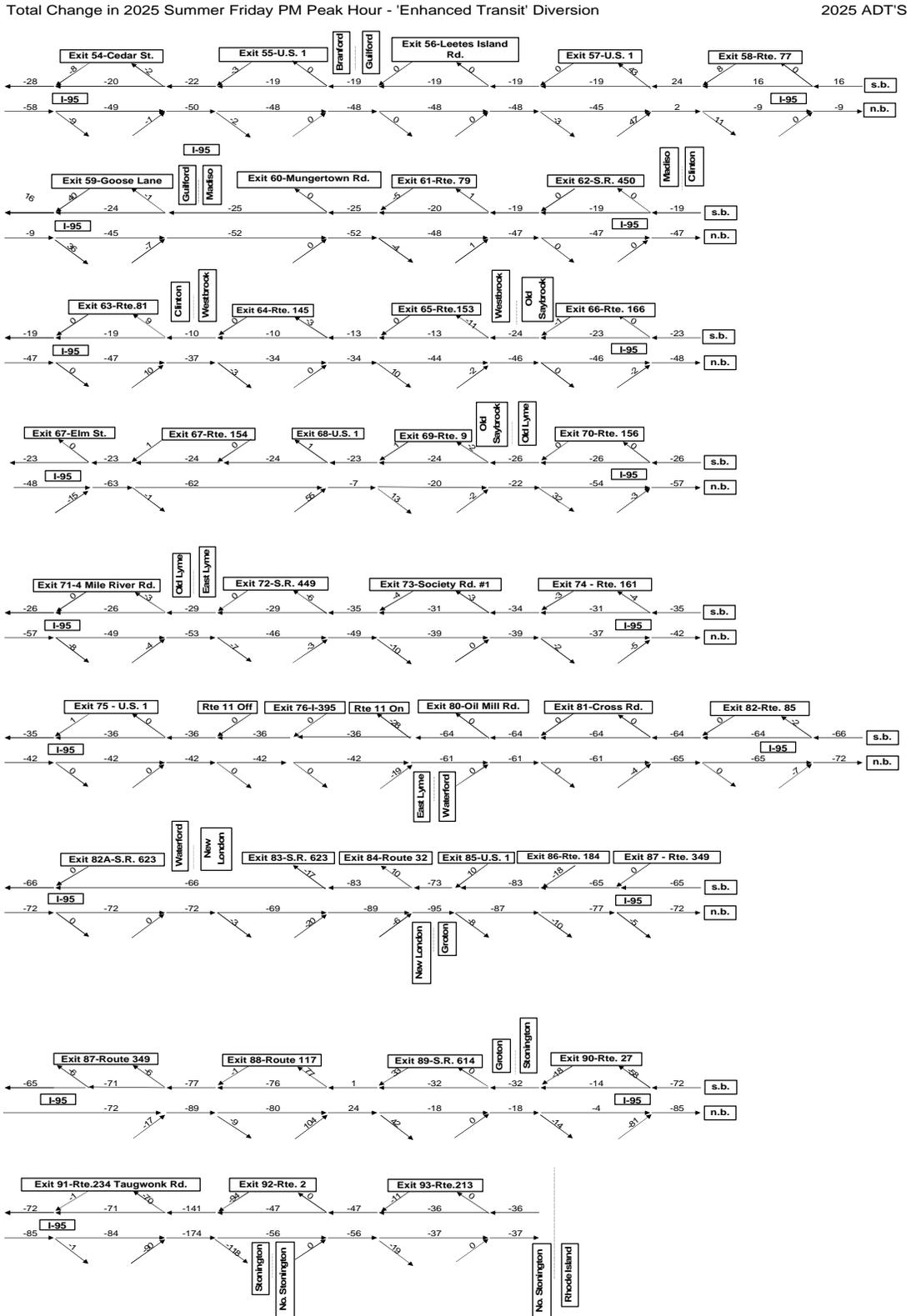


Figure 4 Total Change in 2025 Summer Friday PM Peak Hour

Table 21. Summary of Year 2025 PM Peak Hour Traffic Changes (Enhanced Transit vs. No-Build)

Between Exits		Existing Friday Peak (2002) ⁷		No-Build Friday Peak (2025)		Enhanced Transit Friday Peak (2025)		Percent Diversion
		NB	SB	NB	SB	NB	SB	
53	54	3,710	3,050	4,865	4,000	4,822	3,974	0.78 %
54	55	3,700	3,300	4,744	4,231	4,709	4,211	0.61 %
55	56	3,670	3,160	4,597	3,958	4,564	3,941	0.58 %
56	57	3,520	3,000	4,385	3,737	4,352	3,720	0.67 %
57	58	3,420	3,000	4,306	3,777	4,323	3,803	(0.53) %
58	59	3,190	2,970	4,004	3,727	4,010	3,745	0.31 %
59	60	3,090	2,840	3,903	3,588	3,867	3,566	0.77 %
60	61	2,940	2,640	3,714	3,335	3,679	3,315	0.78%
61	62	2,840	2,610	3,459	3,179	3,427	3,161	0.75 %
62	63	3,040	2,710	3,703	3,301	3,671	3,284	0.70 %
63	64	2,850	2,700	3,474	3,291	3,452	3,283	0.44 %
64	65	2,750	2,480	3,311	2,986	3,289	2,975	0.52 %
65	66	2,650	2,380	3,256	2,921	3,222	2,902	0.91 %
66	67	2,850	2,380	3,565	2,977	3,528	2,529	0.90 %
67	68	2,960	2,690	3,737	3,396	3,687	3,359	1.22 %
68	69	3,330	2,840	4,075	3,476	4,083	3,493	(0.33) %
69	70	4,180	3,740	5,272	4,717	5,228	4,689	0.72 %
70	71	3,430	3,240	4,305	4,067	4,269	4,043	0.72 %
71	72	3,640	3,390	4,590	4,275	4,550	4,248	0.76 %
72	73	3,540	3,360	4,554	4,322	4,513	4,289	0.83 %
73	74	3,490	3,480	4,393	4,381	4,362	4,352	0.68 %
74	75	3,750	3,620	4,737	4,572	4,708	4,547	0.58 %
75	76	3,900	4,270	5,017	5,493	4,987	5,464	0.56 %
80	81	2,820	3,400	3,328	4,012	3,279	3,958	1.40 %
81	82	3,140	3,610	3,680	4,230	3,627	4,174	1.38 %
82	83	3,250	3,360	3,910	4,043	3,850	3,983	1.51 %
83	84	4,500	4,360	5,397	5,200	5,290	5,127	1.42 %
84	85	5,750	6,110	7,069	7,511	7,004	7,449	0.87 %
85	86	4,550	5,160	5,828	6,610	5,787	6,537	1.16 %
86	87	3,550	3,860	4,404	4,788	4,347	4,733	1.22 %
87	88	4,570	3,580	5,785	4,531	5,711	4,470	1.31 %
88	89	4,170	3,260	4,985	3,897	5,019	3,915	(0.59) %
89	90	3,670	3,050	4,253	3,534	4,245	3,519	(0.30) %
90	91	3,100	2,290	3,742	2,764	3,657	2,697	2.34 %
91	92	2,470	1,900	3,001	2,308	2,827	2,171	5.86 %
92	93	2,000	1,370	2,823	1,934	2,767	1,891	2.08 %
93	RI	2,050	1,520	2,810	2,084	2,773	2,052	1.41 %

⁷ Volumes were rounded to nearest 10 by ConnDOT. Year 2025 values were not rounded to permit more accurate diversion percentage estimates.

Although the fraction diverted is quite small, it represents about a doubling of transit use in Southeastern Connecticut. Table 22 shows the estimated increase in summer Friday transit use for both the Step 1 and Step 2 travel markets for both SLE rail service and local buses. On average, Step 1 trip lengths were longer than for Step 2 trips; Step 2 trips are typically between overnight accommodations and tourist attractions. Step 1 trips include many more long-distance trips to workplaces in New Haven and points west.

Over the summer Friday peak hour, it was estimated that the enhancements could divert about 0.7% of the vehicle-miles traveled on I-95 East. Because congestion-related delays grow more rapidly than traffic in this volume range, peak hour delays on I-95 could be reduced by about 0.9%. The net effect would correspond to relieving less than one year’s expected traffic growth in the corridor.

An important limitation on the extent of peak hour diversion effects is that once a peak-hour vehicle is diverted to transit, the road space released is then often taken up by a vehicle from an adjoining slightly less congested hour, whose driver was previously willing to trade off traveling at a less convenient hour for travel time savings.

Table 22. Estimated Changes in Year 2025 Summer Friday Transit Boardings and Vehicle-Miles Traveled (Enhanced Transit vs. No-Build)

	Weekday Average (Step 1)	Summer Friday Additions (Step 2)	TOTAL
Shore Line East Boardings ⁸	1,000	40	1,040
Local Bus Boardings	360	612 ⁹	972
Total Boardings	1,360	652	2,012
Vehicle-Miles Traveled (VMT)	(44,000)	(12,800)	(56,800)
PM Peak Hour VMT on I-95 in Study Area	(2,482)	(736)	(3,218) ¹⁰
Daily VMT Reduction per Boarding (miles)	32.3	19.6	28.2 ¹¹

The overall low estimated decrease in volumes (less than one percent west of Old Saybrook, and no more than 1.5 percent east of Old Saybrook) is not out of line with actual experience. Outside of major urban areas with numerous tourist attractions located directly on high-frequency transit services (New York, Boston, and San Francisco, for example), or major ‘stand-alone’ attractions (such as Foxwoods and Mohegan Sun), use of public transportation to reach leisure attractions is rare. Even in western Europe, the rail market shares for trips comparable to summer Friday traffic on I-95 East are not large. For example, a 1993 survey¹² of total weekend leisure travel (including visits to friends and relatives) by residents of greater Paris to destinations in

⁸ Including trips originating on Amtrak or Metro-North.

⁹ Excluding transfers between local buses.

¹⁰ This represents about 0.7 % of the total peak hour VMT.

¹¹ Combined for all trips (total VMT reduction/total boardings)

¹² Klein, Olivier, and Claisse, Gérard, *Le TGV-Atlantique: entre récession et concurrence*, Laboratoire d’Économie des Transports, Lyon, 1997.

Brittany and the Atlantic coast of France (served by the high-speed *TGV Atlantique*) indicated that:

- 73 percent of single weekend leisure travelers chose rail;
- 22 percent of two-person weekend leisure parties chose rail; and
- 11 percent of parties of three or more weekend leisure travelers chose rail.

These market shares included people without access to automobiles, who comprise four¹³ to fifteen¹⁴ percent of total travel, and probably higher fractions for single travelers. Many travelers visiting friends and relatives were picked up at their destinations. The study notes “with or without TGV, the private car remains the means of transport preferred by more than two-thirds of Parisians for their weekends”.

In a recent study¹⁵ of the potential for providing direct *Eurostar*¹⁶ train service between Paris, Brussels and major English cities beyond London, consulting firm Arthur D. Little note the principal limitations on the ability of improved public transportation to capture leisure travelers with access to autos:

“Regional rail services are unlikely to attract a significant share of the cross-channel car market. Car users and public transport users (air, coach and rail) form distinct markets. Much of car use is by people touring between the United Kingdom and the near continent who want to have the car available throughout their stay. Many car users want room for luggage, equipment or purchases, and many travel with family, friends or colleagues. For these travellers, public transport is unlikely to be an attractive option.

Research on Inter-Capital Eurostar’s market supports that view. From 1994 to 1998, when Inter-Capital Eurostar gained 12 per cent market share, with nearly six million trips in 1998, the share of car travel between the United Kingdom and France and Belgium rose from 40 per cent to 43 per cent. Inter-Capital Eurostar won its share from air, coach and foot passengers. In EUKL’s market research on the travel mode that passengers on Inter-Capital Eurostar might have chosen had Eurostar not existed, only seven per cent chose car. Sixty-five per cent said air. Our focus groups concluded that at the proposed fare levels, few current car users would be likely to be attracted to the Regional Eurostar service even if it did meet their needs. Crossing the Channel with a car and four people from the Midlands to Paris, for example, would cost £220-£280 including fuel, depending on the crossing and the type of car. Even assuming low

¹³ Derived from National Personal Transportation Survey (USA), 1995

¹⁴ Derived from national transportation survey (UK), 2000

¹⁵ Arthur D. Little, Ltd., *Review of Regional Eurostar Services: Summary Report*, (UK) Department for Transport, 2000.

¹⁶ *Inter-Capital Eurostar* is the brand name for the Paris-London and Brussels-London high-speed rail services using TGV-type equipment through the Channel Tunnel.

fares, the same group would have to pay £290-£425, depending on type of ticket and distance and transport to the nearest station, for the Regional Eurostar trip.”

In western Europe, motor fuel prices are two or three times higher than in the U.S., rail service faster and more frequent, intercity rail fares often lower, and local transit access is more frequent and reaches a higher fraction of destinations. These generally favorable circumstances notwithstanding, the planners for the Regional Eurostar decided to ignore the leisure auto traveler market as a source of ridership.

Time and cost comparisons of private versus public transportation for parties traveling between Southeastern Connecticut and the significant New York, New England, and Mid-Atlantic market areas are generally more unfavorable than the UK comparisons above, because of lower gasoline prices and sparse local transit service. The design of the transit enhancements in Section 2 was intended to close this gap at the ‘attraction’ end so far as reasonably achievable. To minimize the risk of underestimating possible transit diversion, this analysis was careful to include leisure auto travelers.

The prospects for general circumstances more favorable to transit use (other than congestion, which is accounted for in the model) prevailing in 2025 in Connecticut appear limited for a number of reasons:

- Changes in public attitudes to support lower fares or significantly higher standards of transit service appear unlikely. It is very unlikely, for example, that motor fuel taxes (a major source of auto operating cost differences between the U.S. and the E.U.) could reach present western European levels¹⁷.
- Market forces are the primary determinant of development patterns in the U.S., and continue to push development outward into areas that are expensive to serve with transit. European-style intervention to reinforce existing urban centers could be seen by many as an infringement of property rights.
- Where high levels of congestion develop in non-urban leisure travel areas formed of dispersed and distinct private entities, they do not tend naturally to develop a strong local transit service; individual attractions and accommodations provide parking for their customers, and congestion spreads to more hours of the day as traffic grows. Cape Cod’s Route 28 in Yarmouth and Barnstable is a relatively nearby example; the limited local bus service is handicapped by the general traffic congestion to the point where it carries a very small fraction of the travel market.

¹⁷ Total state and Federal gasoline taxes ranged between 31 and 57 cents per gallon in July 2003, with 3 to 7 cents per gallon typically directed towards supporting public transportation. Corresponding taxes in northern and western Europe typically range between \$2.00 and \$3.25 per gallon. In 2000, Germany was at the high end of this range, and allocated about 52 cents per gallon (of \$3.25) to support of railroads and urban public transportation.

Therefore it was not considered realistic to assume European general circumstances, or other significant departures from present trends, for this analysis. As discussed in Section 6, the model used in this analysis would yield results similar to those in Europe if those circumstances were to prevail.

4.0 COST ANALYSIS OF TRANSIT ENHANCEMENTS

This section describes preliminary estimates of initial capital costs and year 2025 incremental operating costs and subsidies for the transit service enhancements described in Section 2. The estimates are all in year 2002 dollars, and should be considered preliminary planning-level estimates. This section also includes a preliminary assessment of cost-effectiveness.

4.1 Capital Costs

Table 23 presents estimates of the initial capital costs for the enhancements. The requirements for new vehicles include two additional trainsets for Shore Line East, five highway coaches (including one spare), and 14 local transit buses (including two spares). The allocation of the highway vehicles to specific operators would depend on the actual arrangements for providing the service, and are not material to the costs at the planning level.

The estimate for the new East Lyme/Niantic station is based on a minimal station configuration consisting of one platform on each side of the tracks, a single bus loading location, and a pedestrian bridge over the tracks, with elevators on each side. The platforms were assumed to be roofed for about half their length, and no separate station structure or parking spaces were assumed.

Other improvements could be required to operate the additional SLE service safely and effectively. These were assumed to include a new platform and pedestrian overpass at the Branford station. The need for further track configuration changes would require more detailed analysis to determine. If Amtrak train frequency is not substantially higher than present levels in 2025, then it may be possible to implement the service without making changes other than at Westerly, RI.

The estimate for track changes at Westerly is an approximate value to allow for relocation of switches and signals to make this an appropriate location for reversing trains from New Haven. It is possible that the specific improvements necessary to do this might substantially exceed this amount.

The estimates include a general allowance for modifications (signage and curbing) at New London station to accommodate the summer bus services (routes S1 through S4), and for selected signage upgrades and new stops for the enhanced services.

The total estimated cost is just over \$36 million, with the majority (\$26.1 million) attributable to the rail improvements.

Table 23. Estimated Capital Costs of Transit Enhancements (Year 2002 dollars)

	Quantity	Unit Cost	Total Cost
Diesel locomotives	2	\$4,500,000	\$9,000,000
SLE passenger coaches	6	\$1,500,000	\$9,000,000
Highway coaches	5	\$350,000	\$1,050,000
Transit coaches	14	\$260,000	\$3,640,000
East Lyme/Niantic station	LS	N/A	\$4,900,000
Branford station improvements	LS	N/A	\$3,200,000
Westerly track reconfiguration	LS	N/A	\$5,000,000
New London station bus terminal and local stop improvements	LS	N/A	\$500,000
TOTAL	N/A	N/A	\$36,290,000

4.2 Operating Costs

Table 24 presents a planning level estimate of the additional operating costs of the enhanced transit services. These are based on the additional revenue vehicle hours (RVH) of service provided, at the present average cost of providing an RVH of service (or in the case of Shore Line East, a train-hour). Because there could be some flexibility in how the bus services would be provided, unit costs per RVH reflect urban versus rural operation and average speed, based on actual operations in Connecticut regardless of the specific operator. Additional costs could be incurred for operating and maintaining the new East Lyme/Niantic station, and likely some share of station operating costs at Westerly. The total estimated increase in transit operating costs is just over \$3.0 million per year. This includes year-round rail and bus service, except for routes S1-S4 and the 'trolley' service improvements, which could operate only in the summer. Most of this increase (\$1.75 million) is attributable to the rail improvements.

Table 24. Estimated Annual Incremental Operating Costs of Transit Enhancements (Year 2002 dollars)

	Change from No-Build	Unit Cost	Annual Cost
SLE revenue train-hours	1,243	\$1,500	\$1,864,500
CT bus covering SLE PM	(364)	\$65	(\$23,700)
Rail station operations	N/A	LS	\$125,000
Commuter Connection revenue vehicle hours (RVH)	0	\$65	\$0
Route S RVH	592	\$65	\$38,400
Commuter Express RVH	1,924	\$60	\$115,400
New London – Hartford RVH	4,420	\$60	\$265,200
Estuary Transit District RVH	1,366	\$50	\$68,300
Southeast Area Transit RVH	1,178	\$50	\$68,300
Jolly Red Trolley RVH	607	\$45	\$27,300
Mystic Trolley RVH	169	\$45	\$7,600
Route S1 RVH	2,630	\$50	\$131,500
Route S2 RVH	2,274	\$50	\$113,700
Route S3 RVH	2,197	\$50	\$109,900
Route S4 weekday RVH	1,365	\$50	\$68,300
Route S4 weekend RVH	490	\$50	\$24,500
CT Transit (New Haven) RVH	496	\$65	\$32,200
TOTAL	N/A	N/A	\$3,027,000

4.3 Subsidy Requirements

Like all transit systems in Connecticut, revenue from new passengers attracted by the transit enhancements was projected to be insufficient to cover the incremental operating costs of the enhancements. Table 25 shows a rough estimate of the incremental system revenues. Actual revenue might be slightly more or less, depending on the level of Summer Visitor Pass use, the distribution of Shore Line East trip lengths, and possible induced travel by persons without access to an automobile.

Table 25. Preliminary Estimate of Year 2025 Incremental Revenues (Year 2002 dollars)

Service Type	Annual Incremental Boardings	Revenue per Boarding	Annual Incremental Revenue
Shore Line East (Step 1)	330,720	\$2.75	\$909,500
Shore Line East (Step 2)	4,000	\$2.60	\$10,400
Buses (Step 1)	100,800	\$0.85	\$85,700
Buses (Step 2)	61,200	\$0.85	\$52,000
TOTAL	496,720	\$2.13	\$1,057,600

The total annual revenue was estimated to cover about one third of the estimated annual incremental operating costs. If this additional subsidy of about \$2 million had incurred in 2001, it would have represented an increase of about 1.7 percent in ConnDOT’s statewide transit subsidies for that year.

4.4 Cost-Effectiveness

Table 26 presents information on the cost-effectiveness of the transit enhancements relative to the range of projects recently under consideration for funding support under the Federal Transit Administration's 'New Starts' program. This program is “the Federal government’s primary financial resource for supporting locally-planned, implemented, and operated transit ‘guideway’ capital investment¹⁸.” One of the important criteria for ‘New Starts’ is cost-effectiveness, that is, how much transportation benefit is achieved for each dollar of Federal investment. The measure in this process up to the year 2000 was ‘cost per new rider’, the capital cost divided by the annual number of new riders. In Table 26, the values of this statistic for the range of projects in the Federal fiscal year 2000 process are compared to an estimate for the same statistic for the I-95 transit enhancements.

Table 26. Cost-Effectiveness Comparison (Year 2002 dollars)

Project	Capital Cost	Annual New Riders ¹⁹	Cost per New Rider
Most cost-effective project in FY 2000 New Starts Process	N/A	N/A	\$2.65
Median project in FY 2000 New Starts Process	N/A	N/A	\$10.85
Least cost-effective project in FY 2000 New Starts Process	N/A	N/A	\$51.00
I-95 Transit Enhancements	\$36,290,000	496,720	\$73.06

Although the FTA’s process has been revised since 2000 to include a more comprehensive examination of ‘system user benefits’, this simple comparison suggests that if the enhancements were considered as a stand-alone ‘New Start’, they would probably not be given a good rating for cost-effectiveness.

¹⁸ FTA website as of August 5, 2003.

¹⁹ Assuming that all Step 1 ridership occurs each weekday throughout the year, and has the same weekend-to-weekday ratios as present services, and that Step 2 ridership occurs each of 100 summer days. The actual annual ridership increase might be somewhat lower.

5.0 CANDIDATE ALTERNATIVE ASSESSMENT

5.1 Environmental Screening

On preliminary examination, there do not appear to be any major environmental obstacles to implementing the transit service enhancements. It appears that most potential impacts would be minor.

With respect to air pollution and energy consumption, there could be a net benefit: a reduction of 530,000-630,000 gallons of gasoline consumed at year 2025 demand levels, assuming present automobile fuel efficiency. Only about one fifth of this could be offset by the quantity of diesel fuel required to operate the incremental transit services. With the advent of reduced-emission heavy vehicles, total emissions of air pollutants would be likely to decrease with the enhancements. The reduction would, however, likely be less than one percent of the total vehicular emissions in the study area.

Parks, open spaces, ecological resources, water resources, historic and archaeological resources are unlikely to be significantly affected, because all rail service would occur on tracks where such service is already operating, and all buses would travel on existing highways. The track reconfiguration at Westerly would occur within the existing right-of-way. Station construction at East Lyme/Niantic would likely occur on land that is already either disturbed or in urban use.

Noise from additional buses would generally occur against a significant background of ambient highway noise. Compared to today's schedules, passenger train frequency would increase by only 20-25 percent. Along the railroad, established forms of mitigation such as noise barriers could be used if determined to be necessary and feasible.

The only property uses outside the existing railroad and highway rights-of-way would be the potential new station at East Lyme/Niantic, and a possible expansion of station parking at Westerly, RI. There appears to be sufficient area in the general vicinity of Niantic to accommodate the very modest station intended. The parking expansion at Westerly would be relatively small, and there appears to be land available in the vicinity. Vehicular traffic to and from these stations likely could be accommodated with minor upgrades to the existing traffic control arrangements, rather than widening roadways.

5.2 Screening Evaluation

If the transit enhancements were to be advanced as a Candidate Alternative in their own right (i.e. in the absence of any improvements to I-95), it would ultimately be necessary to establish in an environmental study document that: they constitute the least damaging and practicable alternative; do not have significant adverse effects; and that they would meet the project purpose and need. The information developed in this analysis supports a preliminary screening with respect to these points.

The environmental screening above suggests that the enhancements could not be excluded as being more environmentally damaging than highway improvements, because they would have very small impacts, and would reduce motor fuel consumption, and as a consequence, the emission of airborne pollutants. They are also 'practicable' in the sense that they are achievable at a small fraction of the initial cost of major highway improvements, and could be supported with only a modest increase in the state's total subsidy for transit.

There is, however, another more fundamental requirement for a project alternative in an environmental review: that it substantially achieves the project purpose, as set forth in a Purpose and Need (P&N) statement. Such a statement has not yet been developed for I-95 East, because the process is still in a Feasibility Study stage. However, four study objectives have been established. The following paragraphs summarize the performance of the transit enhancements with respect to each of them.

Preserve/improve the capacity of I-95. No new capacity would be provided, and capacity preservation would be very modest. The transit enhancements would divert traffic to the extent of less than one year's normal growth in highway traffic.

Address each interchange's unique operating conditions and placement in the overall system. The traffic diversion from transit enhancements would not make substantial changes to operating conditions at I-95 interchanges (see Figure 4), and they include no safety or operational improvements to any highway infrastructure.

Enhance arterial street system operations. Because of the small extent of the traffic changes, any effect on arterial streets would be small. Local specifics would be varied: some streets would have slightly decreased traffic, while others (especially near stations) might be slightly busier. Some streets would be slightly impeded by the additional local buses stopping to receive or discharge passengers. It is very unlikely that a significant overall improvement would be found if this were investigated in detail.

Provide for future growth. Although there is some additional railroad capacity inherent in the ability to run longer trains²⁰, the capacity of the enhancements depends substantially on local bus access. The operation of these buses would be affected by general highway congestion, limiting the relative advantage of transit as congestion increases. Absent a major shift in the real price of motor fuel and public policy on transportation, in conjunction with changes in other market forces, it is difficult to foresee transit becoming the mode of choice for a significant share of summer Friday traffic on I-95 East.

The transit enhancements described in Section 2 are unlikely to substantially achieve any of the four objectives, and therefore are not an appropriate choice for a stand-alone alternative in the Feasibility Study. This does not mean that these enhancements, or other transit improvements in southeastern Connecticut, are not warranted in their own

²⁰ It is unlikely that more frequent service could be provided without significant changes to the railroad infrastructure.

right, based on their environmental, transportation, social, or other benefits; such a determination would require further study. Inclusion of a set of transit enhancements in one or more 'Build' alternatives could improve the options available for travel within the corridor.

In summary, the principal conclusion of this analysis is that there appears to be little likelihood that a set of transit enhancements that are within the state's means could avoid the need to make significant improvements to I-95 to relieve summer Friday traffic congestion.

6.0 TRANSIT DIVERSION METHODOLOGY

Most of the trips estimated to be diverted to transit (see Table 22) would be made by permanent residents of the state of Connecticut, as part of their normal weekday travel. This travel behavior was estimated using ConnDOT's statewide travel demand model implemented in the TRANPLAN travel demand forecasting software. A full description of this model may be obtained from ConnDOT. In brief, it uses projected future land use to estimate future travel, and allocates it to transit or highway based on the relative attractiveness of each mode for different trip purposes.

For this analysis, this normal weekday diversion was designated 'Step 1' diversion; it includes three basic weekday trip purposes: home-based work (HBW), home-based other (HBO), and non-home-based (NHB). HBO travel includes shopping, personal business, visiting friends and relatives, and social/recreational trips based at a resident's home. NHB trips include many trips made by non-residents, particular business-related travel related to office and commercial land use. The ConnDOT model does not limit 'park-and-ride' transit ridership to the available parking supply, so the present limitations of parking facilities did not affect the Step 1 ridership estimates at stations or stops with parking provisions.

As indicated in Table 22, the Step 1 results indicated that 1,360 new weekday transit trips for the year 2025 would remove about 44,000 vehicle-miles from the study area highway network. This would correspond to an increase of between 70 and 95 percent over transit ridership in the study area without the enhancements. However, because transit now carries less than one percent of person-miles in the study area, this change is only a small fraction of total travel.

Much of the travel on summer Fridays, especially in Southeastern Connecticut, is leisure travel made by non-residents who are either visiting for the day, or staying in various forms of accommodation for one or more nights. This travel is not well represented in the ConnDOT model. To adjust for this, a separate 'Step 2' estimate was made of leisure travel based on overnight accommodations in Southeastern Connecticut. This section is devoted primarily to presenting the basic technical approach to the 'Step 2' estimate. To avoid the risk of underestimating Step 2 diversion, assumptions were consistently made towards values that would result in larger, rather than smaller, levels of diversion.

6.1 Estimate of the Market for 'Step 2' Diversion

The Step 2 diversion estimate was confined to summer visitors staying at accommodations served by the enhanced transit services. By definition, all Step 2 diversion could come from parties who would choose to travel by private motor vehicle in the absence of the transit service enhancements. Possible additional travel by visitors without access to automobiles might generate additional revenue, but would not represent a diversion of highway traffic. The analysis considered two markets that could be eligible for diversion:

- The *primary market* consisted of parties visiting Southeastern Connecticut who might choose to forgo the use of an automobile for their visit, and rely on the enhanced public transportation service both for access to the area and for local travel while staying in the area.
- The *secondary market* consisted of people visiting or residing temporarily in Southeastern Connecticut who have access to automobiles, but choose to use the enhanced public transportation system to make specific trips, usually between summer attractions and their accommodations.

Public accommodations adjacent to the summer ‘S’ bus routes total some 2,145 rooms, a significant fraction of the total for New London County. Assuming 80% occupancy by non-business travelers during an entire 102-day summer, and reported²¹ average stays (2.4 nights) and party sizes (1.83 persons), the baseline number of visitor parties staying at these transit-adjacent accommodations over a summer was estimated at 72,930. For the year 2025, the baseline estimates were increased by a factor of 2.41, representing annual growth of 3.9 percent, the overall growth rate in tourism to the Americas estimated by the World Tourism Association for 1995-2020. Although tourism has increased by a somewhat higher rate over the past ten years, this historical growth includes two major casinos coming on line, and is not likely to be sustainable over the long term. The 3.9 percent average annual growth is unlikely to be exceeded between 2002 and 2025. Use of this aggressive growth rate made it very unlikely that the Step 2 diversion estimate would be low.

Both the geographical origins and market composition (party size and duration of stay) of visitors to Southeastern Connecticut affect their willingness to divert. About 39% of visits by parties staying overnight were assumed to be ineligible for diversion, either because they are part of a long-distance overland journey by car, or originate from locations poorly connected to either air or surface intercity public transportation. The origins of daytrippers (who do not stay overnight) were assumed to be much more closely clustered around the attractions. Poor access to public transportation that would cover most of the trip was estimated to exclude just over half of daytrippers. The general distributions of assumed primary market origins²² were estimated to be as shown in Table 27.

²¹ Mystic & More! CVB, *New London County Travel & Tourism Economic Impact Assessment*, November 2001

²² Based primarily on interstate auto trip tables published in ‘Passenger Travel in the I-95 Corridor Coalition Region’, Matthew Coogan for the Intermodal Program Track Committee, I-95 Corridor Coalition, October 2001.

Table 27. Assumed Distribution of Origins (Residences) for Primary Summer Vehicle Market

	Daytrippers	Overnight Visitors
East along I-95 (MA, RI, southern NH & ME)	5.1%	16.2%
Greater New Haven, CT ²³	7.5%	4.2%
Greater Hartford, CT	10.0%	4.2%
Greater New York City	3.2%	8.0%
West along I-95 (NJ, PA, MD, DE, DC, VA)	0.3%	14.1%
New London County	24.2%	0.0%
Via air and renting cars at Logan Airport, Boston ²⁴	0.0%	13.9%
Not eligible for primary diversion	52.5%	39.3%

The assumed primary market composition for the baseline visitor estimate is shown in Table 28. These values were synthesized from data from tourist bureaus and Chambers of Commerce covering Connecticut, Cape Cod, Eastern Massachusetts, and Newport, RI.

Table 28. Assumed Primary Summer Vehicle Market Composition (Number of Visitor Parties in Baseline Year)

	One Day in Vicinity	2-4 Days in Vicinity	5 or More Days in Vicinity
Single Occupant	7,153	16,744	5,892
Two Occupants	2,813	6,586	2,317
Three or more Occupants	7,546	17,665	6,215

6.2 Estimating the Transit Share of the ‘Step 2’ Market

Mode splits, or the transit market shares, for both the primary and secondary market shares were estimated by *logit* equations, frequently used by transportation planners to allocate market share in proportion to a measure of each mode’s impedance or disutility. In each case, a form developed for the New Haven Harbor Crossing EIS²⁵ was adapted to the particulars. For primary diversion, the disutility equations were:

$$DU_{\text{drive}} = 0.50 + (1/D) (-0.038 T_{\text{drive}} - 0.057 W_{\text{drive}} - 0.223 C_{\text{drive}}/N - 0.3 W_{\text{drive}}/L)$$

²³ Some of these trips lie outside areas served by local public transportation, and could be reclassified as ‘ineligible’.

²⁴ Some trips would likely use Bradley International Airport or greater New York airports. These trips were all assumed to rent out of Logan because of its superior transit accessibility to New London.

²⁵ *Screening Report, Interstate Route 95 – New Haven Harbor Crossing*, April 1997. Table 4.1.3.3-1, ‘off-peak’ parameter values.

$$DU_{\text{public}} = -1.75 + (1/D) (-0.038 T_{\text{public}} - 0.057 W_{\text{public}} - 0.223 C_{\text{public}}/N - 0.3 W_{\text{public}}/L)$$

In these equations, the variables have the following definitions:

D – the total number of days spent at the leisure destination

N – the total number of people in the traveling party

L – the distance from origin to the leisure destination, in miles

T – half the total time (in minutes) spent traveling in vehicles during the trip, including both line-haul travel to and from home, and all travel between accommodations and attractions in the destination area.

W – half the total time (in minutes) spent waiting for vehicles during the trip, including both line-haul and local travel. Time necessary to pick up or drop off a rental automobile is counted as waiting time.

C – half the total cost of transportation for the trip, in year 1992 dollars, including total operating cost of private motor vehicles.

The transit share of total travel was estimated by the equation:

$$\text{Transit share} = e^{DU_{\text{public}}} / (e^{DU_{\text{public}}} + e^{DU_{\text{drive}}})$$

Because actual data for southeastern Connecticut were not available, and public transportation connections are available to relatively few vacation accommodations and attractions, validation to local data was not possible. These mode split relationships were benchmarked against observed behavior from France, where a 1997 study²⁶ of weekend leisure travel by residents of greater Paris to destinations served by the *TGV Atlantique* was conducted. Figure 5 shows both the survey results from the study and modeled values using the equations above, with a specific adjustment to correct for motor fuel prices in France. As can be seen, agreement was generally close, with the slightly higher model shares for automobile, probably reflecting the higher level of auto ownership in Connecticut. Several important observations from the French study should be noted:

- Rail market shares for leisure trips are generally much lower than for journeys to work or business travel. The commercial strength of the high-speed TGV services lies in the business markets;
- Larger groups make less use of public transportation; the economies of scale of auto use are so considerable, that less than 10% of the total travel by groups of three or more use the train, even though rail is faster than driving;
- Many of the leisure rail users are visiting family and friends, and therefore are likely to have a motor vehicle available for use at the ‘leisure’ end of the trip.

²⁶ Klein, Olivier, and Claisse, Gérard, *op. cit.*

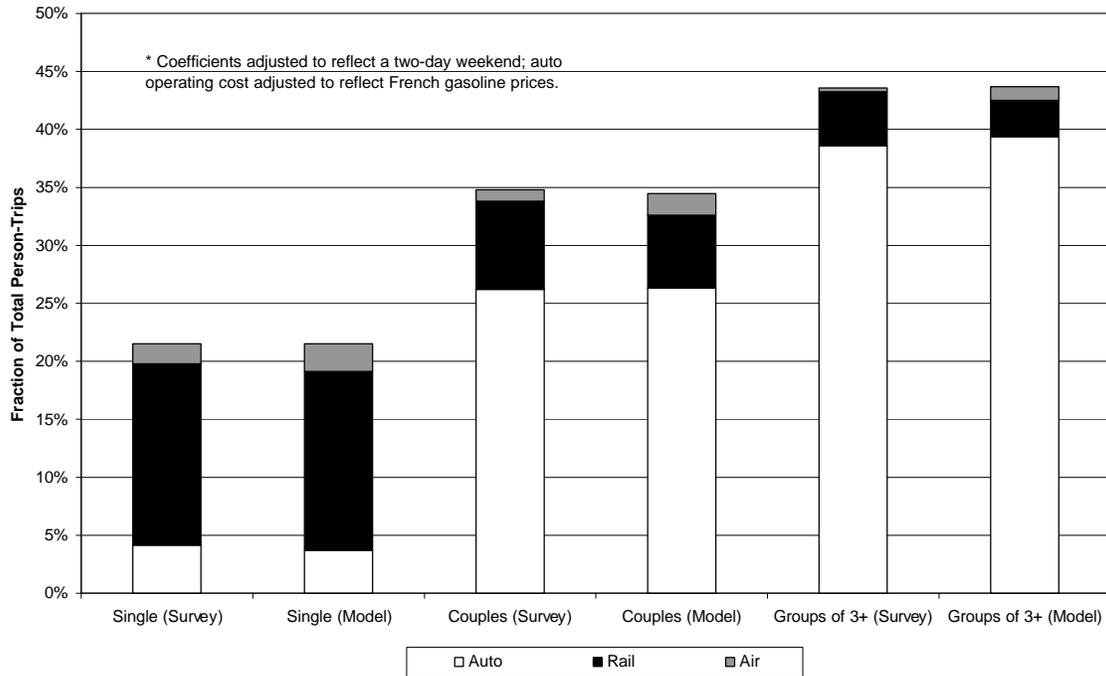


Figure 5 Weekend Leisure Travel by Parisians to TGV Destinations

In effect, the availability of an automobile at the leisure destination (the traveler’s own, a rental, or a friend’s or relative’s) confers a substantial degree of convenience that is difficult to match with either decreased line-haul travel times or with local transit service, even in a nation with a well-developed public transportation system. This is particularly true for leisure attractions, which, like Southeastern Connecticut’s, lie predominantly outside networks of high-frequency urban transit services.

6.3 Step 2 Diversion Estimate

Table 29 summarizes the estimated Step 2 summer Friday diversions by major market segment. The diversion represents the busiest Friday of the summer (estimated to comprise 2.625 percent of total summer visitor activity). Together with the aggressive annual growth assumption of 3.9 percent, these estimated diversion levels are unlikely to be exceeded.

Table 29. Estimated Year 2025 ‘Step 2’ Summer Friday Transit Diversion (Vehicle Trips)

Travel Market	Estimated Divertible Vehicle Trips ²⁷	Vehicle Trips Diverted to Transit	Fraction Diverted
Primary market – access to/from Southeastern Connecticut accommodations on enhanced routes	5,474	18	0.33%
Primary market – local trips while staying in Southeastern Connecticut accommodations on enhanced routes	18,288	65	0.36%
Primary market – day trips to attractions on enhanced routes	3,826	17	0.44%
Secondary market – local and commuter trips based at accommodations on enhanced routes	26,450	257	0.97%
TOTAL	54,038	357	0.66%

Application of the primary diversion logit equations to the estimated recreational travel market to/from Southeastern Connecticut indicated that significant primary market diversion would not occur, *i.e.* that only about one in every 200-300 parties planning such a trip would choose to leave their car at home because of the availability of the enhanced transit services.

Once having made a decision to access Southeastern Connecticut by car, however, the secondary market would still have the choice of taking the enhanced transit service for specific trips between their lodging and major attractions. The logit equations estimated that the enhanced services could capture almost one percent of this secondary market. This higher mode split is in part due to the use of SLE by some longer-term vacationers who would make occasional trips to their workplaces.

Overall, the enhanced services were estimated to divert about 2/3 of one percent of the total eligible primary and secondary trips. Notwithstanding the small market share, in terms of total estimated boardings (trips), Step 2 diversion was estimated to be about 48 percent of Step 1 diversion. In terms of vehicle-miles traveled, Step 2 diversion was about 29 percent of Step 1.

²⁷ Between all eligible origins and destinations; many local trips would not use I-95.